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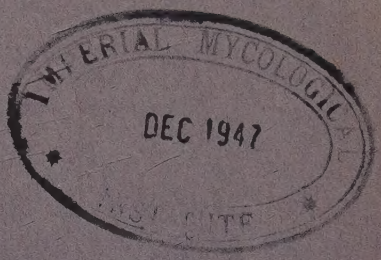

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DISEASES CAUSED BY BACTERIA AND FUNGI

ROMEYN, J. A. (1946.) **The incidence and group of haemolytic streptococci in a western hospital.** —*Canad. J. publ. Hlth.* **37.** 505–506. [Author's summary copied *verbatim.*] **1915**

A group of 463 admissions to the Colonel Belcher Hospital showed 5·6 per cent positive for haemolytic streptococci and 2·6 per cent positive for Lancefield group A streptococci.

Among 184 staff members of the hospital swabbed on one to four occasions, there were 7·6 per cent positive for haemolytic streptococci on the first swabbing. Considering both the first and later swabbings, the total positives rose to 10 per cent. Half of those grouped were group A. Other Lancefield groups found were B, C, E, G and K.

Haemolytic streptococci may be carried in the nose and/or throat for weeks or months. Among the staff positive for haemolytic streptococci, about a third were recorded as "few," a third as less than this, and a third as more.

CROMARTIE, W. J., BLOOM, W. L., & WATSON, D. W. (1947.) **Studies on infection with *Bacillus anthracis*. I. A histopathological study of skin lesions produced by *B. anthracis* in susceptible and resistant animal species.**—*J. infect. Dis.* **80.** 1–13. **1916**

CROMARTIE, W. J., WATSON, D. W., BLOOM, W. L., & HECKLY, R. J. (1947.) **Studies on infection with *Bacillus anthracis*. II. The immunological and tissue damaging properties of extracts prepared from lesions of *B. anthracis* infection.** *Ibid.* 14–27. **1917**

WATSON, D. W., CROMARTIE, W. J., BLOOM, W. L., KEGELES, G., & HECKLY, R. J. (1947.) **Studies on infection with *Bacillus anthracis*. III. Chemical and immunological properties of the protective antigen in crude extracts of skin lesions of *B. anthracis*.**—*Ibid.* 28–40. **1918**

BLOOM, W. L., WATSON, D. W., CROMARTIE, W. J., & FREED, M. (1947.) **Studies on infection with *Bacillus anthracis*. IV. Preparation and characterization of an anthracidal substance from various animal tissues.**—*Ibid.* 41–52. **1919**

I. Histopathological studies of anthrax lesions in susceptible animals (mice, g. pigs and rabbits) and more resistant species (dogs, swine and rats) revealed that germination and proliferation of encapsulated forms of *B. anthracis* occurred at the site of injection in all species, and appeared to occur entirely in the extracellular fluid. In susceptible animals encapsulation continued and the organisms multiplied until death, but in swine and dogs, after 2–4 days, they ceased to multiply. There was loss of capsule followed by fragmentation and disintegration in the extracellular fluid, with little evidence of phagocytosis. The striking features of lesions in susceptible animals were extensive fragmentation of connective tissue, accumulation of fluid in tissue spaces, deposition of fibrin, haemorrhages, and an infiltration with a relatively small number of leucocytes. The organisms were clustered in foci surrounded by large areas of oedematous tissue which sometimes included neighbouring muscles. In resistant species the area was infiltrated with large numbers of leucocytes, many of which appeared necrotic, and the overlying epidermis became necrotic. With resolution there was formation of fibrous tissue and epithelial regeneration.

From these observations it was surmised that a tissue-damaging substance was formed in anthrax lesions and that this substance might be the antigen which induced immunity: also that the factor governing resistance might be an alteration in the extracellular cellular fluid, possibly provided by an antibody derived from the infiltrating leucocytes. These surmises formed the bases of the following studies.

II. The oedematous lesions of inoculated rabbits were extracted in normal saline for 24 hours at 5°C. The crude extract, freed from bacilli by filtration and inoculated into rabbits, produced lesions similar to those of anthrax, and three

weekly injections, two of 0·5 ml. and one of 1 ml. of extract, protected rabbits against 10–100 lethal doses of spores. The evolution of anthrax lesions in immunized rabbits simulated the course in dogs and pigs. A histopathological study of the lesions in immunized rabbits tended to support Ascoli's contention that immunity involves a retardation of the processes which lead to capsule formation, and it is suggested it may operate to reduce the offensive mechanism of *B. anthracis*, allowing the factors of natural resistance to destroy the organisms.

III. The authors describe the electrophoretic and chemical separation of two factors from crude extracts of anthrax lesions. By precipitation with calcium phosphate a tissue-damaging substance in the precipitate was separated from an immunity-inducing substance in the supernatant fluid. The latter substance was partially purified and was found to be destroyed by heat and trypsin, but not by 1% formalin, and to be stable in the lyophilized state over long periods. This substance induced active immunity in rabbits and serviceable immunity in sheep and g. pigs, but was not satisfactory for the immunization of hamsters and mice. Serological studies with hyperimmune rabbit serum failed to reveal any relationship between these protective antibodies and those concerned in precipitin and complement fixation tests, and absorption of these sera with crude extract of lesions failed to remove their protective antibody.

IV. An anthracidal substance was found to occur in the leucocytes of both immune and normal animals and a method of preparing it from calves' thymus is described. This substance injected into mice, four hours before the injection of anthrax spores, and thereafter every four hours for four days protected 48% of mice against 100 lethal doses of anthrax spores. This substance was shown to be a basic polypeptide containing a large amount of lysine.—U. F. RICHARDSON.

VERGE, J. (1945.) Le rôle du bacille tuberculeux de type humain dans le développement des tuberculoses animales. **[Human type organisms in TB. of domestic animals.]**—*Rev. Path. comp.* **45.** 313–316. **1920**

The author presents the results of an investigation into the types of tubercle bacilli responsible for tuberculosis in domestic animals with the exception of cattle and gives the following tabulated figures derived from his own investigations and those of workers in other countries.

Animal Species	Number of Strains Isolated	Type			
		Human	Bovine	Avian	Atypical
Horse	112	11	90	10	1
Sheep	270	1	269	—	—
Goat	54	1	52	1	—
Pig	3,418	98	1,196	2,061	63
Dog	606	392	200	2	12
Cat	132	6	126	—	—

He remarks that in France, TB. of the pig is most commonly of the bovine type, whereas in many other countries avian infection is of considerable importance. Infection with human type in the pig resulting from the consumption of infected material from hotel and restaurant refuse is also considered noteworthy. In conclusion, the author remarks that human type infection plays a small but important part in tuberculous disease of domestic animals; the risk to the human population of the dog infected with human type bacilli is particularly stressed.—J. LOCHIEL MCGIRR.

LETHEM, W. A. (1946.) **Bovine tuberculosis.**—*Mon. Bull. Minist. Hlth Emerg. publ. Hlth Lab. Serv.* **5.** 80–81. **1921**

While about 70% of all cases of non-pulmonary TB. in man are due to infection with the human type of bacillus, by far the major proportion of cases of abdominal TB. in young children are due to infection of bovine type. Consequently the death rate of children under five from this variety of TB. is held to form a reliable index of the extent to which human tuberculosis of bovine origin is prevalent in different areas.

A table is presented giving the death rates from abdominal TB. in children under five in different administrative areas of England and Wales between 1921 and 1944. In 1944 the death rate had fallen in rural areas to about one-quarter of the 1921 figure (from 252 to 60 per million children), in urban districts to one-ninth (from 366 to 42 per million children), in county boroughs to one-twelfth (from 437 to 35 per million children), and in London to one-twenty-third (from 136 to six per million children). These findings correspond roughly to the increase of heat treatment of milk which occurred in the areas concerned during the period under review and, while improved nutrition is probably responsible for the general reduction in incidence throughout the country, it is suggested that the differential reduction is directly related to the increased pasteurization of milk.—J. LOCHIEL MCGIRR.

HERMANSSON, K. A. (1943.) Die Gefährlichkeit Gebärmuttertuberkulose des Rindes für die Verbreitung der Tuberkulose. **[Spread of TB. by cows with infection of the uterus.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* August 6th. 260. **1922**

In Sweden, when congenital TB. is found in a calf at meat inspection, clinical and bacteriological examination of the mother is carried out. If this examination is positive, the cow is slaughtered with compensation.

H. points out that many cases must remain undetected, because relatively few calves appear in the abattoir. In every case of abortion the foetal membranes or the vaginal exudate should be examined for tubercle bacilli and the tuberculin test should be applied in all calves kept for breeding.

In a T.T. herd of 100 animals, a case of abortion occurred in which many tubercle bacilli were found in the vaginal exudate. The cow was destroyed immediately, yet three months later nearly the whole herd reacted to the tuberculin test, including the young stock which had been isolated all the time. In another case, TB. developed after castration of eight piglets. It was found that the veterinarian had previously treated a cow which was subsequently found to be affected with uterine TB.

1 ml. of the vaginal exudate from cases of uterine TB., in dilutions varying from 1 : 100 to 1 : 100 million, killed g. pigs when injected intramuscularly. Infection also occurred in 12 out of 25 animals given 0·001 mg., in nine given 0·0001 mg. and in two given 0·00001 mg. of the original exudate.—C. AHARONI.

DICKEY, E. S. (1945.) **How may the incidence of tuberculosis in hogs be reduced?**—*J. Amer. vet. med. Ass.* **107.** 379–383. **1923**

The problem of TB. of swine and the monetary and food losses which arise therefrom are discussed on the basis of figures derived from the returns of a large commercial undertaking in the U.S.A. It is held that, with the virtual elimination of the disease in the bovine population, TB., as it affects swine at the present time, is due almost entirely to allowing old tuberculous hens to feed with pigs and that improvements which occurred in the period under review (1942–44) were due to farmers heeding the admonition to " keep old chickens and hogs apart." The marked effect of active disease eradication propaganda is stressed and the introduction of a system of federal and state subsidies, whereby a premium would be paid for pigs coming from counties where (a) all chickens were subjected to a test-and-slaughter control system or (b) no farmers permitted birds over 15 months of age to run with hogs, is suggested. The 1943 estimate of monetary losses due to the condemnation of tuberculous swine was $4,000,000.—J. LOCHIEL MCGIRR.

WALLGREN, Å. (1945.) Om ympning mot tuberkulos såsom ett led i tuberkulos-bekämpandet. **[Vaccination against TB. as a part of the control campaign.]** — *Nord. Med.* **27.** 1715–1724. [Abst. in *Bull. Hyg., Lond.* **21.** 168, copied *verbatim.* Signed : D. J. BAUER.] **1924**

A historical review is given of the development of vaccination against tuberculosis, with an account of the results observed in Sweden, where BCG vaccine has been widely employed during the last 20 years (over 57,000 vaccinations were carried out in 1943). The vaccine is given intradermally and a tuberculin test is carried out later ; sensitivity usually develops after 6 to 8 weeks. Adults are also vaccinated if they do not react to the tuberculin test, and are shielded from infection as far as possible until sensitivity develops ; vaccination is repeated if a positive reaction does not develop.

The percutaneous method of vaccination, which is widely employed in Norway, is also described ; in the author's hands a positive reaction does not appear so promptly and with such certainty as after intradermal vaccination.

The duration of immunity produced by BCG is discussed. Retesting is desirable every year, but is impracticable in Sweden, where 200,000 have been vaccinated. It is suggested that tests should be carried out at three years, on entering and leaving school (7 and 15 years) and finally at 21 years.

HERBUT, P. A., & CLERF, L. H. (1946.) **Cytology of bronchial secretions. A diagnostic aid in the diagnosis of pulmonary tuberculosis.**—*Amer. Rev. Tuberc.* **54.** 488–494. [Spanish summary.] **1925**

In a series of 210 examinations of bronchial secretions obtained by bronchoscopy, 57 cases proved to be bronchigenic carcinoma, 47 of which revealed cancer cells in the secretion. In the same series, 13 cases had clusters of irregular cells containing cilia and bearing a superficial resemblance to epidermoid bronchigenic carcinoma, together with giant cells of the Langhan type. Subsequent case histories showed that these cytological features indicated a tuberculous infection and that the presence of these cells may permit a presumptive diagnosis of pulmonary TB. six weeks before a culture of the organisms can be obtained. The limitations of the method are discussed.

—R. E. GLOVER.

—. (1947.) Zur Frage der Gültigkeitsdauer von Zeugnissen über Tuberkulosefreiheit. **[Duration of validity of certificates of freedom from TB.]**—*Schweiz. Arch. Tierheilk.* **89.** 149–151. **1926**

When a bovine animal is in a non tuberculin-tested herd, a certificate declaring it free of TB., as judged by a negative tuberculin reaction, is valid only for maximum six weeks after the date of the actual test and no certificate declaring an animal free of TB. should be furnished later than six weeks after such a test.

Animals living on T.-T. premises free of TB. may not be certified free of the disease later than six months after tuberculin-testing.—C. AHARONI.

STEENKEN, W., Jr., & WAGELY, P. F. (1945.) **Comparison of the golden hamster to the guinea pig following inoculations of virulent tubercle bacilli.**—*Proc. Soc. exp. Biol., N.Y.* **60.** 255–257. **1927**

Experiments are described indicating that golden hamsters are highly resistant to doses (30,000–60,000 organisms) of a virulent strain of human type tubercle bacilli which produces widespread TB. in g. pigs. Twenty-four days after infection all g. pigs had marked reactions to skin tests with 0·1 ml. of 5% and 10% Old Tuberculin, while not one of the hamsters exhibited any evidence of sensitivity. The conclusion reached is that hamsters are of little or no value for the routine diagnosis of TB.

—J. LOCHIEL MCGIRR.

BALLABIO, C. B., & MASSERINI, P. P. (1945.) Immunitá antitubercolare da complesso auro-batterico tubercolare, nella cavia. **[Immunization of g. pigs against TB. by means of a gold compound of** *Mycobact. tuberculosis.***]**—*G. Batt. Immun.* **33.** 145–183. [Abst. in *Bull. Hyg., Lond.* **21.** 546, copied *verbatim.* Signed: H. HAROLD SCOTT.] **1928**

This is a long paper but its contents can be summed up quite shortly. After a general disquisition on tuberculin and the reaction of the body to it, from the days of Koch, the authors record the results of inoculation of 40 guineapigs with 0·8 mgm. of a compound which they designate the *auro-tubercular bacterial complex* (C.A.B.T.) suspended in 0·4 cc. of physiological saline. [This compound is not further defined; the authors content themselves with stating that previous publications have made known the technique of its preparation. It is clearly a metallobacillary compound. In the succeeding paper, however, Villa states that "like other bacteria, that of tuberculosis in contact with a salt of gold absorbs the metal into its structure."]

Twenty guineapigs received a single injection, 20 others had a second six months later. Living and virulent tubercle bacilli were then inoculated into them. Those of the first group maintained their weight, except those which died of intercurrent disease, enteritis and salmonella infection. Survival of the others averaged 530 days, with limits of 377 and 622. The site of injection of the virulent organisms became swollen and the draining glands enlarged; in some, ulceration occurred, with final repair, others showed a residual nodule. The autopsy findings in the others are given in a table of details.

The second group also retained their weights; six died of intercurrent disease; those which lived did so for, on an average, 811 days; three lived for more than three years. Photomicrographs show the histological changes in the organs, liver, spleen and lung. The results of the inoculation are, first, the formation of a granulomatous deposit at the site of injection, after which the intradermal tuberculin reaction is promptly positive, and immunity to a degree develops with resistance to a dose of 0·25 mgm. of living and virulent *Myco. tuberculosis.* The fact that a second injection may be followed by a survival of more than three years after virulent organisms are inoculated gives ground for hoping that actual clinical recovery can take place.

POPE, H., & SMITH, D. T. (1946.) **Synthesis of B-complex vitamins by tubercle bacilli when grown on synthetic media.**—*Amer. Rev. Tuberc.* **54.** 559–563. [Spanish summary.] **1929**

The authors studied the ability of the tubercle bacillus to synthesize vitamins of the β-complex. H 37 and Ravanel strains of the tubercle bacillus were cultured on a synthetic medium, and the cell-free filtrate was used for assays of biotin, folic acid, inositol, nicotinic acid, *p*-aminobenzoic acid, pantothenic acid, pyridoxine, riboflavin and thiamine. All the vitamins were found to be synthesized by both strains of the tubercle bacillus. The human strain, H 37, synthesized 50 times more nicotinic acid than the bovine strain; other deviations, while less striking than that of nicotinic acid, were also suggestive of underlying variations in actual synthetic abilities of the two strains. The human type bacillus produced significantly more folic acid, inositol and *p*-aminobenzoic acid than the bovine type organism.

—E. KODICEK.

KREFFT, R. A. (1945.) Pseudo-tuberculosis ovina: estudio bacteriologico de procesos caseosos de lanares Magallanicos. **[Caseous lymphadenitis of sheep.]**—*Agric. téc., Chile.* **5.** 152–175. [English summary.] **1930**

An investigation of caseous lymphadenitis in sheep in Magallanes province was undertaken in the laboratories at Santiago. It was found that the organism (*Corynebact. ovis*) retained its vitality for 480 days at –15°C. and for 170 days when stored in glycerin. It may be associated with staphylococci or streptococci.—R. MACGREGOR.

LOVELL, R. (1946.) **Studies on *Corynebacterium renale*. I. A systematic study of a number of strains.**—*J. comp. Path.* **56.** 196–204. **1931**

LOVELL, R., & COTCHIN, E. (1946–47.) **Studies on *Corynebacterium renale*. II. The experimental pathogenicity for mice. III. Penicillin treatment of experimentally infected mice.**—*Ibid.* **56.** 205–214 and **57.** 20–27. **1932**

I. Thirty-six strains of corynebacteria were studied for their morphology, cultural characteristics, biochemical and serological reactions. Of these, ten strains were isolated from the kidneys or bladders of affected animals, 16 strains originated from the urine of cows with clinical symptoms of pyelonephritis and the remaining ten strains were a variety of corynebacteria including *Corynebact. pyogenes*, *Corynebact. ovis* and *Corynebact. equi*. The results obtained in the first two groups were comparable. The formation of a clear zone around colonies of *Corynebact. renale* grown on milk agar plates appears to be a characteristic of this organism. Most strains fermented glucose only, among the sugars tested, and the majority were V.P.- and M.R.-positive. L. showed that practically all the strains tested were able to split urea. Antisera produced in rabbits showed a definite relation between all strains of *Corynebact. renale*, as judged by the precipitation test, and some indication that other species of corynebacteria were related. Injections of strains of *Corynebact. renale* into mice, intravenously, showed that the organisms may be isolated in larger numbers from the kidneys or the bladder than from other tissues; a very large dose is required to infect mice.

II. Experiments were made to determine the affinity of *Corynebact. renale* for kidney or bladder tissue in mice following injections with the live organism. It was shown that the concentration of *Corynebact. renale* reached the kidneys in three days and gradually a marked reduction occurred up to the 16th day, at which time the concentration was greater in the bladder. An account is given of the lesions produced in the kidneys of mice. Viable counts from kidney tissue of infected mice showed considerable multiplication of *Corynebact. renale* following intravenous inoculation of a large number of organisms (20 million per ml.). Other routes of injection and lower doses had little success. Injections of *Corynebact. renale* in g. pigs, rabbits or chick embryo, were followed by little or no illness or multiplication of the organism. The authors conclude that infection by a haemotogenous route is possible in mice and draw attention to the possibility of this mode of infection in the natural disease in bovines.

III. *In vitro* experiments showed that of 12 strains studied, sensitivity to penicillin varied from 0·1 to 0·0001 units per ml. Experiments in mice showed that when penicillin was given early and the doses frequently repeated, treatment was of value, as judged by cultural tests and histological examination.—B. WEITZ.

JACOTOT, H. (1940.) Vaccination contre la pasteurellose des boeufs et des buffles. **[Vaccination against pasteurella infection of cattle and buffaloes.]**—*Rec. Méd. vét. exot.* **13.** 17–21. **1933**

J. reviews the use of an earlier vaccine consisting of bacterial suspension in immune serum. In the eight years 1930–37, 500,000 animals were vaccinated with good results. This vaccine, however, required the preparation of large quantities of immune serum and had bad keeping qualities under tropical conditions. An alternative vaccine was prepared from the toxins of *Past. boviseptica*, by lysing 36-hour broth cultures with distilled water, at 48°C. for 36 hours. The lysed culture was held at 37°C. for a further 36 hours and this product constituted the vaccine.

Tests in rabbits showed that exposure to 50°C. for more than three days during the intermediate stage of preparation destroyed the antigenic power of the vaccine. Reduction of this stage below 12 hours also produced a vaccine of no value, when tested in calves and rabbits.

The strain of organism used for vaccine production was of great importance. Vaccine from a good antigenic strain protected calves in doses of 1–2 ml. and rabbits in doses of 0·5–1·0 ml. against a test dose of virulent organisms. In one instance a good degree of immunity was established in three days from the administration of vaccine, and the duration of immunity was at least 2–3 months. Even after seven months at 30°C. the vaccine was still effective although double the initial dose was necessary to give the same protection. Almost 200,000 cattle had been vaccinated with this material since 1937, using a dose of 1–3 ml. according to size. Vaccination carried out annually before the usual season of incidence was recommended.—J. B. BROOKSBY.

POPE, C. (1946.) **Infectious pneumonia of swine. Prevention and control.**—*J. Dep. Agric. Vict.* **44.** 417–419. **1934**

The symptoms and P.M. findings in pneumonia caused by pasteurella in pigs are described.

Emphasis is given to the role of management in the prevention of this condition. In Victoria the paddock system of pig raising is more suitable than the sty system for the prevention of this and other diseases. The introduction of pigs is a common source of outbreaks and if animals are not bought from a known disease-free herd they should be kept separate from the resident pigs for three weeks. No suitable treatment or biological method of prophylaxis is available.

—D. C. Blood.

*Hecht, O. (1943.) Consideraciones entomológicas a la epidemiologia de la peste bubónica de los roedores en Venezuela. [**Entomological aspects of the epidemiology of bubonic plague of the rodents of Venezuela.**]—*Bol. Min. Sanid. Asist. Soc., Caracas.* **8.** 1159–1162. [Abst. from abst. in *Biol. Abstr.* Sect. F. **19.** No. 1. 39.] **1935**

During 16 months 90% of the fleas on sylvatic rodents were *Rhopallopsyllus* spp., except for two months about a year apart, when there was an increase in *Xenopsylla cheopis* and *X. brasiliensis*. Concurrent epidemics suggest the possibility that plague is maintained in rodents by the former genus, while increase of the latter two species introduces the human phase.

Magrou, E., & Brisou, J. (1946.) A propos d'une épizootie de peste dans un élevage de cobayes. [**An epizootic of pasteurellosis in a g. pig colony.**]—*Bull. Soc. Path. exot.* **39.** 119–121. Discussion pp. 121–122. **1936**

During an epidemic of human plague a number of losses occurred in two g. pig colonies housed in buildings infested with rats. At first P.M. examinations were indefinite and cultures apparently negative. Later, a careful search revealed Gram-negative bodies in the spleens and a very slow growing organism identified as *Past. pestis* was recovered in culture.

In the discussion, Girard described a similar outbreak in g. pigs. The rat flea (*Xenopsylla cheopis*) was capable of transmitting infection to g. pigs, which usually died several days after the fleas succumbed. He suggested that in outbreaks of this type, all infected animals should be killed off and the rooms and cages sterilized and treated with D.D.T. before clean stock were reintroduced.—R. E. Glover.

Herbert, D. (1947.) **Streptomycin in experimental plague.**—*Lancet.* **252.** 626–630. [Author's summary copied *verbatim*.] **1937**

Streptomycin inhibits the growth of the plague bacillus in vitro and, in concentrations of 3 units/ml. or over, brings about rapid sterilization of plague cultures.

In mice infected subcutaneously with a highly virulent plague strain, in dosage sufficient to kill 100% of control animals, 2½ day courses of streptomycin injections (800 units/day) started 0, 24, and 48 hours after infection gave 85%, 60%, and 5% survival. A dosage of 1600 units/day for 3½ days gave 90%, 95%, and 35% survival when started 0, 24, and 48 hours after infection.

In guineapigs infected by subcutaneous injection, 3½ day courses of streptomycin injections (40,000 units/kg./day) gave 100% survival, even when dosage was delayed for 48 hours after infection.

Streptomycin is equally effective in the treatment of artificially induced pneumonic plague in both mice and guineapigs.

Penicillin and sulphathiazole also inhibit the growth of *Past. pestis*, which in vitro appears more sensitive than most gram-negative organisms to these drugs. In comparative tests in infected mice, however, streptomycin was considerably more effective than sulphathiazole, and penicillin was only slightly effective, even in very high dosage.

Vianello, G. (1945.) La vaccinazione contro il colera aviario con il vaccino a germi vivi attenuati (pasteurella aviseptica attenuata). [**Vaccination against avian pasteurellosis with living attenuated organisms.**]—*Clin. vet., Milano.* **68.** 1–8. **1938**

Poultry were successfully protected against virulent strains of *Past. aviseptica* by a vaccine prepared from virulent organisms which had been subcultured 40–50 times. Each subculture was kept for two days at 12°–15°C. before resowing. It was tested on g. pigs and not used until the lethal dose for these animals was reduced to 0·005 ml. The dose for the fowl was 1 ml., given subcutaneously into the thigh and repeated in eight days. After inoculation, egg production was reduced for a few days and the birds appeared depressed. The vaccine could be stored for a year in a thermostat at 37°C. or dried and kept on plates.—R. Macgregor.

Hinshaw, W. R., & McNeil, E. (1946.) **The occurrence of Type 10 paracolon in turkeys.**—*J. Bact.* **51.** 281–286. **1939**

A coliform organism was isolated from 19 outbreaks in turkeys and turkey poults on 17 different ranches; when studied antigenically, the organism was shown to be a paracolon Type 10, as designated by Edwards *et al.* [see *V. B.* **14.** 371]. The symptoms and pathology observed in these outbreaks resembled those seen in salmonellosis. The mortality was 5–70% and was most severe during the first 14 days but losses continued in some cases for five weeks. There was

evidence that the organism could be transmitted through the egg and spread in the hatchery in the same manner as salmonella. All the 19 outbreaks were confined to one area of California approximately 70 miles square and to poults hatched from eggs originating in that area. Only a very small percentage of reactors to the agglutination test were disclosed among the survivors of acute outbreaks and it was considered that the infection was more easily eliminated than in pullorum disease. The organism was also recovered from normal adult turkey carriers on four different ranches and it was thought that infection might occur from other animal carriers, particularly rattlesnakes, from which species the organism had also been isolated.

Cultural, antigenic, and pathogenicity studies of the organism are described in detail. Preliminary experiments indicated that sulphonamide drugs might be of value in the treatment of this condition and sulphamerazine was used with success on a group of eight-day-old poults which had already had a 12% mortality; the drug was administered at a dosage of 0·25% in the mash for six days. There were no reactors to the aggln. test amongst the survivors when they were tested six months later.—J. D. BLAXLAND.

BONEY, W. A. (1947.) **Isolation of Shigella gallinarum from turkey eggs.**—*Amer. J. vet. Res.* **8.** 133–135. **1940**

374 eggs, collected from 17 turkey hens, all reactors to the tube agglutination test for pullorum disease, were incubated and then examined bacteriologically. *S. pullorum* was not recovered from any of the eggs but it was isolated from the ovaries of two of the 17 hens when they were killed and examined at the end of the experiment. *Salmonella gallinarum* was recovered from one infertile egg but not from cultures of any of the organs at autopsy. In a further experiment, *S. gallinarum* was isolated from five out of 12 turkeys, all of which were reactors to the tube aggln. test for pullorum disease, but in no case was *S. pullorum* recovered.—J. D. BLAXLAND.

BIANCHI, E. (1945.) Un nuovo aspetto dell'azione patogena della Salmonella abortus equi. [**A new aspect of the pathogenicity of** *Salmonella abortus-equi.*]—*Clin. vet., Milano.* **68.** 9–12. **1941**

B. records *S. abortus-equi* as being responsible for a type of equine paratyphoid, the main predisposing cause of which appears to be fatigue from overwork. Symptoms are weakness, loss of appetite, pale or yellowish mucosae, oedema and swelling of the sternal region and hind legs and rise in temperature and pulse rate. The animal may die in a few days to a few weeks, or is often slaughtered in very poor condition. *S. abortus-equi* may be recovered from the internal organs and lymph nodes.—I. W. JENNINGS.

QUIROGA, S. S., & MONTEVERDE, J. J. (1945.) Investigación de bacterias del género Salmonella en cerdos enfermos de peste y viruela. [**Salmonella organisms in pigs with swine fever and swine pox.**]—*Rev. Med. vet., B. Aires.* **27.** 226–241. **1942**

Specimens from six cases of swine pox and 96 cases of swine fever were examined for the presence of salmonella. Twenty-eight strains were isolated from 26 of the animals. *S. choleraesuis* var. *kunzendorf* predominated (21 strains). Other strains isolated were *S. typhi-murium* (3), *S. onderstepoort* (2), *S. paratyphi B* (1) and *S. muenchen* (1).

The authors note the absence of *S. choleraesuis*, *S. typhi-suis* and *S. typhi-suis* var. *voldagsen.* They also observe that while the incidence of *S. cholerae-suis* var. *kunzendorf* is lowered in normal swine it is the dominant type in sick swine.—I. W. JENNINGS.

*PESTANA, B. R., & RUGAL, E. (1943.) O porco normal como portador de Salmonella. [**The normal pig as carrier of salmonella infection.**]—*Rev. Inst. Adolfo Lutz.* **3.** 232. [Abst. in *Biol. Abstr.* Sect. F. **18.** No. 10. 37, copied *verbatim.* Signed: A. BRAGA.] **1943**

The authors investigated the Salmonellas in the mesenteric lymph glands of 100 apparently normal hogs slaughtered for market, and obtained 15% of positive cases. The Salmonellas isolated were classified, in accordance with the Kauffmann-White's scheme (Bergey, 1939), as *S. schottmülleri*, 4; *S. derby*, 3; *S. choleraesuis*, var. Kunzendorf, 2; *S. newport*, 1; *S. anatis*, 5. The tetrathionate brilliant green Kauffmann's medium is advantageous as a medium for enrichment of the Salmonellas.

WINAND, H. (1940.) Infektion Entenbestandes mit Bact. ent. Gärtner-Jena. [*S. enteritidis* **infection of a duck-farm.**]—*Arch. wiss. prakt. Tierheilk.* **75.** 387–406. **1944**

Cases of human food poisoning from the meat or the eggs of infected ducks have often been described, but apparently no bacterial evidence regarding the specific organism (*S. enteritidis*) has been recorded in the literature.

In the case described five ducks were found to show titres of 1 : 400 and after two months 1 : 25 against *S. enteritidis*, whilst a natural infection with *S. breslau* superimposed later could only be traced from the intestinal content: this organism had not yet penetrated the intestinal wall. An open ditch serving as drainage for a block of houses was thought to be the source of

infection. The ducks had no clinical symptoms, but lesions of oophoritis and orchitis typical of *S. pullorum* infection were found P.M.—C. A.

GAUGER, H. C., & GREAVES, R. E. (1947.) **Isolation of *Salmonella typhimurium* from the feces of artificially infected poults.**—*Poult. Sci.* **26.** 48–51. **1945**

The faeces of 12 turkey poults, survivors of four larger groups inoculated when five days old with 1·0, 0·5, 0·1 and 0·01 ml. of a 26–hour beef extract broth culture of *S. typhi-murium*, were cultured at intervals up to 108 days after inoculation. After the 23rd day, isolation of the organism was relatively infrequent and only three of the 12 infected poults carried infection longer than 50–60 days after inoculation, the last recovery of the organism being from a single poult on the 96th day. Judging from the bacteriological examination of faeces and of various tissues at autopsy, ten of the 12 inoculated poults had thrown off the infection by the time they were 15 weeks old; the organism was recovered from the caecal mucus of the remaining two poults when they were autopsied on the 105th day after inoculation.

—J. D. BLAXLAND.

LOVE, J., & DRISCOLL, R. H. (1945.) **Anaphylactoid (Sanarelli-Shwartzman) reaction following therapeutic antityphoid injections; with report of fatal case.**—*Nav. med. Bull., Wash.* **45.** 1104–1110. [Abst. in *Bull. Hyg., Lond.* **21.** 261, copied *verbatim*.] **1946**

A fatal reaction following a second intravenous injection of antityphoid vaccine given within a 24-hour interval for non specific therapy is reported.

The autopsy findings of generalized petechiae throughout the parenchymal organs and brain, and massive necrosis of the liver and kidneys, indicate this to be a generalized anaphylactoid reaction similar to that obtained by Sanarelli and Shwartzman in experimental animals.

This reaction can be avoided by allowing an interval of at least 48 hours between injections.

I. THOMSEN, A. (1938.) Bidrag til Belysning af Spørgsmaalet om den smitsomme Kalvekastnings Udbredelse og Bekaempelse i Danmark. **[Control of contagious abortion in Denmark.]** —*Maanedsskr. Dyrlaeg.* **50.** 305–314.

II. THOMSEN, A. (1942.) Bidrag til Belysning af Spørgsmaalet om den smitsomme Kalvekastnings Udbredelse og Bekaempelse i Danmark. II. Meddelse. **[Control of contageous abortion in Denmark. II.]**—*Ibid.* **54.** 1–14. **1947**

I. The small island of Fejø, with 100 herds containing 1,087 bovines, more than one year of age, had 13% infected herds. An eradication campaign was started in 1936 and by 1938 only one herd containing reactors. On the island of Bornholm blood-testing was carried out in 1937 in 97% of the herds and 33% of the herds were found to contain reactors. 14% of the total number of cows reacted. Most of the herds with more than 50 cows were infected. 15% of the smallest herds (with 1–5 cows) were infected.

II. The collective examinations of herds on the island of Bornholm and in dairy farming areas in other parts of the country had been continued by agglutination testing of blood samples since the previous report [see I]. The percentage of herds containing reactors varied considerably from 7·1% in some districts to 40·2% in others. In all, 7,759 herds containing 78,866 head of cattle more than one year old, have been examined. About 30–40% of infected herds contained only one reacting animal, 12–15% contained two reactors and 25–50% contained more than three.

—H. C. BENDIXEN.

THOMSEN, A. (1944.) Bidrag til Belysning af Spørgsmaalet om den smitsomme Kalvekastnings Udbredelse og Bekaempelse i Danmark. III. Meddelelse. **[Bovine brucellosis in Denmark. Its incidence and control. III.]**—*Maanedsskr. Dyrlaeger.* **56.** 580–604. [For part II, see abst. preceding.] **1948**

III. This report is based upon the results of the serological tests for brucellosis carried out on cattle in Danish herds. Results are given in great detail for each dairying district, herd and animal over one year old. A map shows the distribution of the districts.

In October, 1944, farms in 340 out of all the 1,661 dairying districts had been tested (42,384 herds with 441,284 cattle). 10,618 (25%) of the herds contained at least one reactor and 11% of all the cattle reacted.

The work continues, 104 fresh dairying districts having been dealt with.—J. E.

LEGROW, W. R. (1947.) **The opsonic index as applied to tolerance and immunity to Brucella abortus in cattle.**—*Thesis, Cornell.* pp. 118. **1949**

Many workers assume that a high opsonic index in bovine brucellosis is indicative of immunity. The author feels this is not always true since many animals with a high index have the disease in chronic form. These studies were initiated on several groups of cattle with known history regarding brucellosis in an effort to obtain conclusive evidence of the reliability of the test as a criterion of tolerance and immunity to the infection.

The standard tube agglutination test, and opsonic index test (Huddleson) were conducted on each animal at the time of bleeding. The stain

of McCullough and Dick was used. In reading the opsonic index, the interpretation of Foshay and LeBlanc was used by the author. Infection of animals was determined by cultures and guinea pig inoculation.

Most of the animals used in the experiment were from a herd used at the Veterinary Experiment Station to determine the duration of immunity following vaccination. There were 38 animals in the group. Detailed histories of all animals were available for study.

The animals studied were divided into six groups: (1) a group of eight animals that had been exposed to brucellosis for years and which possessed a degree of tolerance or immunity, (2) 11 animals known to be infected with brucellosis, (3) 18 animals having a low, fluctuating titre for a year or more, (4) 17 animals that were assembled for an experiment to determine the duration of immunity following vaccination, (5) 16 calves studied for the correlation between the opsonic index and agglutination following vaccination and (6) a group of 25 calves studied to determine if opsonins were in their blood prior to receiving colostrum.

The author concludes that the opsonic index is not in itself a criterion on which to evaluate the susceptibility or immunity of an animal to brucellosis. Cattle with a negative to low blood agglutination titre and a high to very high opsonic index exhibit a high degree of immunity to brucellosis. Most animals with a negative to low agglutination titre together with a negative to low opsonic index contract brucellosis under exposure. The blood titre and opsonic index tend to build up simultaneously in calves following vaccination. The peak of immunity seems to be reached when the agglutination titre has returned to negative while the opsonic index remains high. There does not seem to be any transfer of opsonins from the dam to the calf *in utero*.—H. L. Gilman.

González, R. I. (1945.) Relación entre virulencia, actividad antigénica y aglutinabilidad en el género Brucella. I. Sobre la presencia de formaciones capsulares en los Brucella de virulencia exaltada. **[The relationship between virulence, antigenic activity and agglutinability of the genus *Brucella*. I. The formation of capsules by brucella of enhanced virulence.]**—*Rev. Sanid. Hig. publ., Madr.* **19.** 749–753. **1950**

González, R. I., & Mata, J. M. (1945.) Relación entre virulencia, actividad antigénica y aglutinabilidad en el género Brucella. II. Sobre la presencia de un antigeno capsular en el Brucella Melitensis virulento. **[The relationship between virulence, antigenic activity and agglutinability of the genus *Brucella*. II. The presence of a capsular antigen in virulent *Brucella melitensis*.]**—*Ibid.* 754–767. **1951**

[Absts. in *Bull. Hyg., Lond.* **21.** 467–468, copied *verbatim*. Signed: R. Lovell.]

I. Strains of *Brucella melitensis* and of *Brucella abortus* were passaged through mice of 16 to 18 gm. in weight, by intraperitoneal inoculation, and the organisms were recovered from the blood stream. A regular and consistent passage was ensured by introducing some material such as starch or mucin into the peritoneal cavity of the mice at the time of injections. The cultures became enhanced in virulence so that a dose of from 300 to 500 million *Br. melitensis* was fatal for mice in 24 to 96 hours. This increased virulence was associated with the formation of capsules, which were demonstrable in films fixed with alcohol, stained with carbol-fuchsin and differentiated with copper sulphate. A contrast was effected by the use of Indian ink. Capsules were observed less regularly in strains of *Brucella*, which had not been passaged through mice. The author considers the formation of capsules to be associated not only with increased virulence, but also with the production of an antigen which is distinct from the somatic antigen. The limited observations made suggest that the virulence of *Br. melitensis* is more easily increased than that of *Br. abortus*.

II. The observations already recorded by the first author, that strains of *Brucella* with an exalted virulence possess capsules, are confirmed. The sera of animals which have been immunized against such capsulated strains contain agglutinins which react with capsulated strains. The agglutinins appear to be distinct from the agglutinins induced by strains of *Br. melitensis*, which are in the smooth phase but contain no capsules. Similar agglutinins which react with the capsules were also observed in the sera of human beings suffering from *Br. melitensis* infection. Furthermore, those agglutinins can be specifically absorbed from the sera by saturation with capsulated *Brucella*. It is therefore considered that the capsular antigen is of some importance, inducing in animals its corresponding antibody to a higher degree than that induced by the smooth somatic antigen. There are differences in the form of agglutination, for whereas the reaction with smooth non-capsulated strains and the corresponding antibody is granular in form, that produced by capsulated strains and the corresponding antibody is more floccular in appearance. Agglutination of capsulated bacteria occurs more rapidly at 37°C. than in the case of non-capsulated forms, and zone phenomena are apparently more frequent.

MOLLAND, J. (1944.) **Oxidation-reduction potentials in cultures of anaerobic bacteria.**—*Acta path. microbiol. scand.* **21.** 673–712. [In English.] **1952**

A detailed explanation is given of the theoretical basis of the measurement of oxidation-reduction potential in cultures and the results from the study of several species growing anaerobically are tabulated. The apparatus which allowed measurements to be made directly from the growing culture is fully described, with illustrations. Argon was used to exclude oxygen from the apparatus. Six species of the common obligate anaerobes gave strikingly similar results. The potential decreased rapidly during the first 12 hours, then more slowly to reach a relatively constant level of –0·28 to –0·32 volts after 36 hours. Facultative anaerobes, such as *Staph. aureus* and *Bact. coli* produced a different potential curve. The value decreased more slowly and uniformly and only reached a level of about –0·1 volt. Numerous other experiments were carried out with different media and with the inclusion of thioglycollic acid. The findings are fully discussed both from the practical and theoretical viewpoints. —J. KEPPIE.

WHITE, P. B. (1945.) **The stability of the three gas gangrene antitoxins, *Perfringens*, *Vibrion septique* and *Oedematiens* under different conditions of storage.**—*Quart. J. Pharm.* **18.** 363–367. [Abst. in *Bull. Hyg., Lond.* **21.** 336, copied *verbatim*. Signed: G. PAYLING WRIGHT.] **1953**

Six specimens of gas gangrene antitoxins (two each for *Cl. welchii*, *Cl. septicum* and *Cl. oedematiens*) were dispensed in sealed glass ampoules and maintained, shielded from light, for periods of up to 50 months at temperatures of 4°C., 16°C. and 37°C. From time to time, estimates of potency were made. None of the preparations kept for 50 months at 4°C. showed any significant deterioration. Those maintained at room temperature for the same time showed losses of 10–25 per cent. of their original potency. There was greater variability amongst those kept at 37°C.; after 8–12 months their potency had fallen to about 75 per cent., and after 50 months to about 50 per cent. of their original strength.

BYTHELL, D. W. P., & PARKER, W. H. (1946.) **The control of enterotoxaemia in fattening sheep by a single inoculation with Cl. welchii, Type D, anaculture.**—*Vet. Rec.* **58.** 367–368. **1954**

Deaths due to pulpy kidney disease may cause an average mortality of 5% among yearling sheep running on arable crops in Shropshire. During October, 2,010 yearlings, chosen at random and forming about half the total of each of 13 flocks were inoculated subcutaneously with 5 ml. of an anaculture of *Cl. welchii*, Type D, leaving the remaining 2,040 yearlings on these farms as controls. Up to the following April 11 deaths had occurred among the vaccinated group, of which two were due to enterotoxaemia. Thirty-three of the controls had died, 21 of the deaths being due to enterotoxaemia. The authors consider vaccination to be worthwhile under present conditions.—G. B. S. HEATH.

HARTLEY, P. (1945.) **The effect of freezing on the potency of tetanus antitoxin.**—*Quart. J. Pharm.* **18.** 359–363. [Abst. in *Bull. Hyg., Lond.* **21.** 335, copied *verbatim*. Signed: G. PAYLING WRIGHT.] **1955**

To determine whether the potency of tetanus antitoxin, as prepared for civil and military use in 1939–40, would be seriously affected by freezing and thawing, as might happen under service conditions, samples of four batches of antitoxin were exposed to temperatures ranging from –4°C. to –10°C. for various periods. In spite of the fact that they all contained 0·35–0·4 per cent. of tricresol, and were thawed without mixing, no samples were found to have deteriorated by more than 10 per cent. of their initial values.

AMIES, C. R. (1945.) **The stability of tetanus antitoxin.**—*Quart. J. Pharm.* **18.** 367–373. [Abst. in *Bull. Hyg., Lond.* **21.** 335, copied *verbatim*. Signed: G. PAYLING WRIGHT.] **1956**

Preparations of tetanus antitoxin containing 0·35 per cent. of cresylic acid were stored at 2°–4°C., at room temperature (average, 19°C.) and at 37°C., and their potencies determined periodically. Deterioration followed a roughly exponential curve. At 2°–4°, the average loss per annum was 3 per cent.; at room temperature, the loss was 50 per cent. in six years; at 37°, half the potency was lost in 12 months.

It is suggested that this loss of potency results from the action of the proteolytic enzymes naturally present in the serum.

LEGROUX, R., JÉRAMEC, C., & LEVADITI, J. C. (1945.) Statisque du botulisme de l'occupation 1940–1944. **[Statistics of botulism during the occupation of 1940-44.]**—*Bull. Acad. Méd.* **129.** 643–645. [Abst. in *Bull. Hyg., Lond.* **21.** 323–324, copied *verbatim*. Signed: W. G. SAVAGE.] **1957**

During the five years before the recent war the authors diagnosed only three outbreaks of botulism, but as many as 417 during the four years of the German occupation of France, each involving 2 to 10 persons; over 100 slightly affected cases are excluded from this total. They estimate that there were, during these four years, at least

500 outbreaks and over 1,000 cases. The Pasteur Institute confirmed the diagnosis in 205 cases. The sources of infection in 163 cases was ham, either salted and smoked or pickled; in 30 cases food preparations containing rabbit (3), duck (1), veal (4), goose (4), pork (10), fish (2), vegetables (6) —spinach (2), haricot beans (1), asparagus (1), peas (1), and *flageolets* [kidney beans] (1); in the remaining 12 cases pies of pork, veal or rabbit.

Of the 295 other outbreaks not bacteriologically investigated the source of infection was known. For all 500 outbreaks, in no less than 93 per cent. the origin was pig meat in one form or another.

The foods causing deaths were raw ham (1 death), preserved peas (1), preserved goose (2), preparation of rabbit (2), preserved asparagus (2), a fresh tunny preparation (3), and food pies (4). The toxins were type A, causing 7 deaths, and type B, with 8 deaths. These 15 deaths occurred in about 1,000 persons affected. The authors call attention to this very low case mortality, compared with outbreaks in U.S.A. and elsewhere. Types A and B were about equally toxic. The gravity of the attack depended on the quantity of toxin ingested. All the fatal cases were those in which the food was taken cold. The very low fatality in those who were affected by slices of ham is probably explained by the small quantities eaten. Of over 900 persons affected from this source, only one died.

*Herrer, A. (1943.) Microorganismo, posiblemente del grupo Bartonella-Grahamella, aislado de un perro. [**A micro-organism, possibly of the *Bartonella-Grahamella* group, isolated from a dog.**]—*Rev. Med. Exp., Lima.* **2.** 1–8. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 1. 31, copied *verbatim*. Signed: A. C. Walton.] **1958**

A pleomorphic organism was isolated from a splenectomized dog, cultivated on several media (Geiman's and blood agar), and re-established in other splenectomized dogs by inoculation. The taxonomy of the form was not established although it resembles *Bartonella bacilliformis* in several respects, and should be regarded as a member of the *Bartonella-Grahamella* complex.

Guimarães, L. M., & Lacerda, P. M. G., Jr. (1945.) Micose em bovinos de São Paulo por Tricophyton faviforme album (Sabouraud 1909). [*T. faviforme album* **infection of cattle in São Paulo.**]—*Rev. Fac. Med. vet. S. Paulo.* **3.** 151–154. **1959**

This outbreak of ringworm took place in a group of nine bullocks kept in close proximity to other bovines and equines. The infection remained confined to the group, and attacked mainly the head and neck. The disease was transmitted experimentally to man by light scarification, lesions developing in 21 days. Cultures from cattle and man showed the features of *T. faviforme album*.—I. W. Jennings.

Seibold, H. R. (1946.) **A case of histoplasmosis in a dog.**—*J. Amer. vet. med. Ass.* **109.** 209–211. **1960**

For a period of two months before death, the animal described gradually lost weight and condition. The stools were loose and the temperature was at times slightly elevated. Autopsy revealed enlargement and greyish mottling of the liver and enlargement of the spleen and visceral lymph nodes.

Histological examination revealed a macrophage invasion of the hepatic sinusoids and the lymph nodes and red pulp of the spleen. These mononuclear phagocytes contained yeast-like organisms, consisting of a central, dark staining, body surrounded by a clear, unstained zone. Similar phagocytic cells, containing histoplasms, occurred in smears of heart blood.

S. points out that although histoplasmosis is usually considered a fatal disease, it has been suggested that both histoplasmosis and blastomycosis may have benign, self-limiting, forms. Some observations have been published suggesting that calcified pulmonary lesions among tuberculin-negative persons, which are common in certain areas of the United States, may be mycotic in origin.—U. F. Richardson.

Caspersson, T., Malmgren, B., Thorell, B., & Bjerkelund, E. (1945.) Nukleotidomsättning och kärnorganisation hos bakterier. [**Nucleotide metabolism and nuclear organization in bacteria.**]—*Nordisk. Med.* **28.** 2636–2640. [English summary.] [Abst. in *Bull. Hyg., Lond.* **21.** 255, copied *verbatim*. Signed: D. J. Bauer.] **1961**

The presence of nuclear material in bacteria (*Bact. coli, B. subtilis* and others) was investigated by observing the absorption of ultraviolet light by organisms in various stages of growth. Organisms in the logarithmic phase of multiplication showed strong absorption at 2600 Å, while at the beginning and end of the period of growth absorption was low. By the persistence of absorption after various chemical treatments it was shown to be due to the presence of ribose nucleotides. Curves of nucleotide content and rate of bacterial multiplication coincide when plotted on suitable scales, indicating that nucleotides are necessary for the synthesis of protein which accompanies cell division, and suggesting that bacteria possess a nuclear mechanism.

In Feulgen-stained preparations of a number of bacteria (types not stated) the authors observed

a cell organ containing deoxyribose nucleotide, which divided at cell division. This is considered to be homologous with the gene-bearing chromatin (euchromatin) of higher cells, while ribose nucleotide, which appears during the logarithmic phase of growth, is homologous with heterochromatin which governs the synthesis of cell protein.

See also absts. **1976** (influenza and bacterial infections of mice), **1987** (staphylococcus antitoxin), **1990-1992** (TB. and trichinella infections), **2057** (*Str. lactis* R factor and folic acid), **2085** (haemorrhagic septicaemia), **2093** (pullorum disease and sulphamerazine), **2094** (contagious abortion and sulphapyridine), **2095** (*Staph. aureus* and tissue extracts), **2096** (mastitis therapy), **2097-2105** (penicillin), **2106-2109** (TB. therapy), **2110** (propamidine), **2111, 2112** (clostridial infections), **2133** (*Cl. welchii* in cheese), **2134** (*Staph. aureus* in cheese), **2149-2155** (technique), **2172** (anthrax, ulcerative lymphangitis, contagious abortion, bovine pleuro-pneumonia, etc.. in Kenya), **2173, 2174** (mastitis, contagious abortion, etc. in U.S.A.), **2175** (actinomyces in liver abscess, mastitis, swine erysipelas, etc.).

DISEASES CAUSED BY PROTOZOAN PARASITES

CARR, A. K. (1943.) **Dourine appears for first time in California.**—*Bull. Calif. Dep. Agric.* **32.** 46–49. **1962**

Dourine was reported in Arizona in 1940 and California prohibited the importation of horses, mules and asses over six months old from that state unless they were accompanied by a certificate of having passed a complement fixation test within the previous 30 days. In 1941 similar action was taken to prevent introduction from Nevada, but in February, 1941, infection was discovered in horses imported from Mexico.

The disease, as evidenced in California, was unpredictable symptomatically, the only reliable method of diagnosis being the c.-f. test. Gelded animals which had no history of contact with infected animals were found infected.

Horses had been tested in seven counties. Blood samples were collected in 1 in. × 8 in. test tubes, the samples being delivered to the field laboratory, where about 9 ml. of serum was poured into shipping bottles to which 1 ml. of merthiolate was added. The serum was sent to Washington for testing. Animals were identified by a numbered pasteboard tag clipped into the mane by a self-locking metal clip. From March, 1941, to November, 1942, 25,584 equines had been tested, with the detection of 29 reactors.

—U. F. RICHARDSON.

MACGREGOR, J. J., & SHAW, I. G. (1945.) **Estimated financial loss caused by an outbreak of trichomoniasis on a commercial dairy herd.**—*Fmrs Rep. Harper Adams agric. Col., Dep. Econ.* No. 23. pp. 4. [Abst. in *Dairy Sci. Absts.* **7.** 131, copied *verbatim.*] **1963**

In the years 1939–1941 the daily milk production of a herd of 58 cows was 80 gal. in the winter and 180 gal. in the summer. In May 1942 trichomoniasis was diagnosed, and winter production dropped to 30 gal. although, in the following summer, the average was still 180 gal. In the next winter production was 40 gal. a day. The financial loss incurred over the two winters was estimated as being £1,592 from milk and £388 from herd replacements, calving losses and veterinary expenses. An estimated saving of £300 on feedingstuffs resulted from the fall in production.

*TIEVSKY, G., & SCHAEFER, B. G. (1944.) **Canicola fever (Leptospirosis canicola). Report of a human case and review of the literature.**—*Med. Ann. District Columbia.* **13.** 11–16. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 7. 45, copied *verbatim.* Signed: M. B. PETTIT.] **1964**

Of great importance from the public health standpoint and in regard to attempts at specific therapy is the fact that there is a strong cross-agglutination between *Leptospira icterohemorrhagiae* and *L. canicola* which may result in an erroneous diagnosis of Weil's disease. The probable existence of a large canine reservoir in the U.S. with some potentiality for human infection is pointed out.

BERNKOPF, H., OLITZKI, L., & STUCZYNSKI, L. A. (1947.) **Studies on bovine and human leptospirosis.**—*J. Infect. Dis.* **80.** 53–63. **1965**

Experimental work is recorded on a disease believed to be due to a leptospira and affecting cattle, goats and sheep in Palestine. The infection in cattle varied clinically from slight fever, with a reduction in milk yield, to high fever with a pink or brown discoloration of the milk, which sometimes contained blood clots, jaundice, and the appearance of bluish patches, or nodules on the skin, progressing to ulceration. Cases may be sporadic or may occur as an epidemic.

Successful transmission was accomplished by the inoculation of blood from animals in the febrile, or early jaundice stage, into young calves, of which seven died and six recovered. A suggestion is made that the method of infection might influence the severity of the reaction. Leptospira were demonstrated in liver and kidney sections and were isolated in culture from the blood of an experimentally infected calf on the ninth day of fever, cultures on the other days being negative. Cultures became positive in four weeks and growth in Noguchi's medium was less luxuriant than that of *L. canicola* or *L. icterohaemorrhagiae.* Subcultures developed readily in Schueffner's medium.

Sera from normal cows and calves did not agglutinate this organism, but sera from recovered cows and experimental calves agglutinated it in high dilutions (1 : 200 to 1 : 10,000), although they agglutinated rat and dog strains up to 1 : 40 to 1 : 80 only.

Cultures inoculated into calves produced a characteristic though mild reaction with fever, leucocytosis and a rise in blood urea up to 66–100 mg. per 100 ml. Blood from infected calves failed to cause illness in rabbits, g. pigs, mice, rats, hamsters and puppies, but caused a febrile reaction and jaundice in goats, and febrile reactions in one sheep and two rhesus monkeys. Seventeen human sera from cases of severe jaundice with kidney involvement agglutinated the bovine organism at dilutions of 1 : 1,280 to 1 : 25,000, showing a considerably higher titre than when tested against the rat or dog strains.

Three cases of human fever and jaundice with high blood urea and a high agglutination titre to the bovine leptospira are recorded, the subjects having been in contact with infected cattle. One death resulted. It is considered that the organism was probably identical with *L. icterohaemoglobinuriae vitulorum* of Michin and Azinow. [No evidence is presented that the disease produced by culture inoculation was infectious, or conferred immunity.].—U. F. Richardson.

Coste, F., Morin, M., & Hardel, H. (1941.) Trois cas parisiens de maladie des jeunes porchers. [**Three cases of swineherd's disease in Paris.**]—*Bull. Mém. Soc. Méd. Hôpit., Paris.* **57.** 713–717. **1966**

A description is given of a disease in three workers at a piggery, which, it is suggested, was identical with *méningo-typhus éruptif des porchers* [swineherd's disease], originally described from alpine areas of France and Switzerland and now stated to be extending its range.

A description of the clinical picture in each instance is given; no disease was noted among stock in the piggery; no virus was isolated from the human patients and no subsequent immunity tests were made. [More recent work on this disease suggests that *Leptospira pomona* may be the cause—see *V. B.* **17.** 313 & 314.]

—S. B. Kendall.

See also absts. **2086** (phenanthridinium toxicity), **2113** (piroplasmosis chemotherapy), **2114** (antimalarial drugs), **2115** (leishmaniasis therapy), **2156** (complement-fixation test for Chagas' disease), **2172** (trypanosomiasis, theileriasis and trichomoniasis in Kenya), **2173–2175** (coccidiosis and anaplasmosis), **2176** (pathology of tropical diseases).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Michelsen, E. (1946.) Mund- og Klovesyge-Kulturvirus. [**Foot and mouth disease culture virus.**]—*Maanedsskr. Dyrlaeg.* **58.** 85–105. **1967**

This is a review of experiences at the F. & M. disease research establishment on Lindholm island, which was founded in the winter of 1934–35 when Toussieng studied the technique at Riems and of the Dutch workers. The Danish work developed from the latter and Fogedby in particular made much progress in virus culture, using as seed material, lymph or aphtha tissue, as culture material, skin, lung or placenta from calf foetuses, and as perfusion fluid, calf plasma or serum and Tyrode's fluid or the latter alone. The standard technique which developed made use of lymph, foetal skin, heparinized calf plasma and Tyrode's fluid.

Culture takes place at 37°C. in an atmosphere of Co_2. Commonly, cultures have been carried on without loss of virulence or reduction in potency for about one dozen passages, but two exceptionally long series of 34 and 60 successful passages have been obtained. The time at which passage transfers are made is important; the virus is at its greatest degree of multiplication about 48 hours after start of the culture, so transfers are best made after this interval. The most favourable pH for virus increase was found to be 7·6, which it is best preserved *in vitro*.

Virus type remains true during culture and no change in virulence occurs. It has occasionally been observed that high dilutions of a culture virus are infective for g. pigs, while low dilutions of the same are not infective. The explanation is obscure, but it is considered that the phenomenon is associated with the formation of virus antibodies in the culture and originating from the solid constituent. Another curious experience has been the finding of an apparent increase in virulence of a sample of culture virus in phosphate buffer kept for a long time in cold storage. It is suggested that this is due to a liberation of virus particles from the bulk of the tissue culture.

The effect of adding various substances to tissue cultures of F. & M. disease virus was studied. Fowl embryo extract and extracts from the lungs, spleen and thymus of calf foetuses had no stimulatory effect on virus growth. Extract of red blood corpuscles from calves had no effect, neither had gonadotropic, cortico-adrenotropic or thyrotropic hormones, but extract from the mucous membrane of the small intestine from cows and potassium bromide (0·5%) plus potassium iodide (0·1%) had a slight stimulating effect

in all or most cultures so treated. The effect of stirring the solid constituent (skin) of cultures in hypertonic saline for a few minutes immediately before setting up the culture was to increase the final yield of virus in most cases tenfold, in one case one hundredfold and in some cases not at all.

In a series of experiments on the vigour of tissue culture growth and virus multiplication, the connexion was found to be negative.

In a discussion on the reliability of the *in vitro* culture of F. & M. disease virus, M. explains that although cultures have been carried on for years, absolute reliability has not been achieved. Lately, for instance, there have been failures of obscure origin.

Nevertheless, a reliable vaccine is produced from culture virus for use in the field, in place of natural virus. Although certain batches of culture virus vaccine, attenuated by heat and formalin as in the established technique with natural virus, have served excellently in the immunization of farm animals, there have been failures with other batches and the use of cattle as sources of virus for vaccine production is as yet still necessary.—J. E.

Bonét-Maury, P., & Frilley, M. (1946.) Action des rayons X sur le virus de la fièvre aphteuse et la vaccine. [**Action of X-rays on viruses of foot and mouth disease and vaccinia.**] —*Ann. Inst. Pasteur.* **72.** 432–437. **1968**

The authors report the results of inactivation by X-ray irradiation of a neurotropic strain of vaccinia virus and a g. pig strain of F. & M. disease virus. The effect of irradiation was expressed as the energy necessary to reduce the titre of the virus suspension by tenfold. This was calculated to be $1{\cdot}32 \times 10^{18}$ pairs of ions per ml. for vaccinia virus and 1×10^{18} for F. & M. disease virus. The size of the F. & M. disease virus particle was estimated from this value to be 17–24·5 mμ. By the same method the particle size of vaccinia virus appeared to be 15–21·5 mμ, compared with the figure of 240 mμ obtained by other methods, including irradiation by α-rays. The authors explain this discrepancy by suggesting that the X-ray-sensitive elements of vaccinia virus is about 20 mμ in diameter, but that these normally form an aggregation of 240 mμ in diameter and in the case of α-ray irradiation the inactivation of one element leads to the inactivation of the aggregation by migration of energy. [Lea & Salaman —see *V. B.* **12.** 585—have already suggested that the vaccinia virus particle is composed of radio-sensitive and radio-insensitive constituents.] The method of interpreting the effect of irradiation by citing the energy required to reduce the titre of the virus suspension by tenfold seems open to question as, with most methods of titration available for the two viruses studied, a tenfold difference is too close to the smallest difference that can be regarded as significant.—W. M. Henderson.

Anon. (1947.) **The foot-and-mouth disease situation.**—*Fed. Vet.* **4.** No. 2. 1 & 3. **1969**

The threat to the cattle of the U.S.A. which arises from the outbreak of F. & M. diseases in Mexico is discussed. The Mexican outbreak started in 1946 and at the time of writing affected nine Mexican states. In anticipation of infection entering the U.S.A., veterinarians had already been selected and instructed and equipment collected in readiness for an eradication campaign. Legislation to enable the U.S. Department of Agriculture to co-operate with other American countries in the control and eradication and provision of funds has been requested from the legislature.

The erection of a fence along the U.S.-Mexican border for a distance of 675 miles is planned.

A joint Mexican-U.S. commission recommends the sending of equipment and personnel to Mexico, control of movement of animals out of infected areas and destruction of contacts and wild ruminants and swine.—M. C.

McKee, A. P., & Hale, W. M. (1946.) **Reactivation of overneutralized mixtures of influenza virus and antibody.**—*J. Immunol.* **54.** 233–243. **1970**

The detection of carriers of influenza virus may be difficult if the virus in washings is overneutralized by antibody in the mucus. It has been shown that apparently neutral mixtures, *i.e.*, suspensions in which the virus can be recovered by serial passage of mouse lungs, can be reactivated by simple dilution or by papain digestion. On the other hand, the virus in overneutralized mixtures in which serial passage in mice is negative, cannot be separated by these means.

M. found that concentrated allantoic fluid (P.R. 8 virus) heated at 57°C. for 70 min. shows a substantial loss in the power to agglutinate red cells, but can still bind serum antibody. If this heat-inactivated fluid is now added to overneutralized serum-virus mixtures for two hours at room temperature, virus can be recovered on inoculation into mice or into embryonated eggs. This reaction is serologically specific since it does not occur when inactivated A virus is added to a mixture of B virus and antiserum. In these experiments approximately 10% of the virus was recovered from the mixtures.—R. E. Glover.

Tropa, E. (1945.) Sur la valeur antigénique des vaccins antirabiques chloroformés homologues.

[The value of chloroform-treated rabies vaccines.]—*Rev. Med. vet., Lisboa.* **40.** 385–391. **1971**

Chloroform-treated rabies vaccine is stated to be protective with one-third the dose required for phenol-treated vaccine.—R. MACGREGOR.

GREENWOOD. (1945–46.) **Tenth report on data of anti-rabies treatments supplied by Pasteur Institutes.**—*Bull. Hlth Org. L.o.N.* **12.** 301–364. **1972**

This is the tenth and last of the series of reviews of rabies statistics made by the Health Organization of the League of Nations. It summarizes the results obtained in 1,670,848 persons treated with ten types of vaccine. The mortality from rabies over the whole series was 0·31%. Of the persons bitten, 81·2% had been bitten by dogs, 5% by cats and 1·8% by jackals; only 0·2% had been bitten by wolves. The mortality in persons bitten by different species of animal was as follows:– 0·30% bitten by dogs, 0·04% by cats, 8·70% by wolves, 1·48% by jackals, 0·02% by solipeds, 0·004% by ruminants, 0·08% by other animals and 0·01% by man.

After tabulating the statistics, G. discusses generally the value of statistical methods as applied to these collected data. His discussion is detailed and interesting but not suitable for abstraction. He concludes that from the data no decision can be made regarding the relative efficiency of any of the methods of vaccination in use, nor does he consider that further accumulation of data in the present form will be useful. —M. C.

*TELLEZ, GIRÓN, A. (1944.) El vampiro portador de virus del derriengue. **[The vampire bat, carrier of "derriengue" virus.]**—*Rev. Soc. Mex. Hist. Nat.* **5.** 35–42. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 2. 42, copied *verbatim.* Signed: J. DE ALBA.] **1973**

Virulent tissue was obtained from the salivary glands and brain of *Desmodus rotundus murinus* and found to cause typical "derriengue" reactions in guinea pigs and mice. Material from an infected cow found in the same locality was equally virulent. All available evidence suggests the similarity of "derriengue" and bovine paralytic rabies; it only remains to be proven by immunological identification that South and Central American paralytic rabies and "derriengue" are identical.

DOWNIE, A. W., & DUMBELL, K. R. (1947.) **Survival of variola virus in dried exudate and crusts from smallpox patients.**—*Lancet.* **252.** 550–553. [Authors' summary copied *verbatim.*] **1974**

The chorio-allantoic membranes of developing hens' eggs, which are susceptible to infection with variola virus, have been used to detect the presence of virus in vesicle fluid and crusts from smallpox patients. By this means virus was found to survive in diluted vesicle fluid dried on glass slides for 35 days when exposed to daylight, and for 84 days when kept in the dark at room temperature. Virus was recovered from different samples of crusts kept at room temperature for several months, and from one specimen kept thus for over a year. In crusts exposed to daylight virus survived as well as in crusts kept in the dark. The bearing of these observations on the spread of smallpox is briefly discussed.

I. BALLOWITZ, K. (1943.) Untersuchungen über die Einwirkung von Virusinfektionen auf den Verlauf bakterieller Magen-Darmerkrankungen beim Auftreten der Roskilde-Krankheit in Dänemark. **[Investigation of the action of virus infections on the course of bacterial gastro-intestinal diseases, in connexion with Roskilde disease in Denmark.]**—*Z. Hyg. Infektkr.* **125.** 175–214. **1975**

II. BALLOWITZ, K. (1944.) Die Einwirkung verschiedener Influenzavirusstämme auf bakterielle Infektionen bei der weissen Maus. **[The effect of various strains of influenza virus upon bacterial infections in white mice.]**—*Ibid.* 559–566. **1976**

[Absts. in *Bull. Hyg., Lond.* **21.** 220, copied *verbatim.* Signed: D. J. BAUER.]

I. A consideration of the clinical features of Roskilde disease, in which influenzal symptoms are accompanied by gastroenteritis, has led the author to suggest that latent pathogenic intestinal organisms have been activated by a simultaneous virus infection. In an experimental investigation of this hypothesis, white mice were infected with the PR8 strain of influenza virus, and also with *Bact. typhosum*, *Bact. paratyphosum* A and B, or *Br. abortus.* Typhoid bacilli showed a wider distribution in seven virus-infected animals than in five controls, being found in mesenteric glands, spleen, cervical glands and liver. In 11 mice infected with influenza virus and *Bact. paratyphosum* B, the bacilli were found in spleen, liver, cervical glands and lungs; but in nine control mice, the bacilli were mostly limited to the abdominal lymph glands. The lungs also contained intestinal saprophytic bacteria, and pneumonic changes were more marked in mice with the double infection than in mice infected with virus only. Similar results were obtained in infections with *Br. abortus.*

From a consideration of these results it is suggested that Roskilde disease may be due to an

influenza-like virus which increases the pathogenicity of organisms already present in the gut, producing gastro-enteritis; various kinds of non-specific enteritis may be of similar aetiology.

II. This is a continuation of previous work by the same author [see above] on the effect of influenza virus upon infection of white mice with various bacteria. Here the effect of various strains of the virus is investigated. Mice were given paratyphoid bacilli by mouth, and influenza virus intranasally. PR8, C201, WS and Talmey strains of virus were used, and also swine influenza virus. Control mice not receiving virus showed a slight spread of paratyphoid bacilli to spleen and lymph glands, while in mice infected with virus as well, bacteria were generally distributed in lungs, liver and blood stream. Spread was most marked with PR8 and swine viruses, and was accompanied by liver necrosis and enteritis. In a repetition of the experiment with virus material from later passages, the potentiating effect of PR8 and swine viruses had declined, while the other strains of virus produced a severe bacterial infection. The bacterial lesions were more severe when the virulence of the virus employed had increased in passage. This is perhaps analogous to the severity of bacterial complications in human pandemic influenza.

VOGELSANG, E. G., & GALLO, P. (1942.) Ensayos de infección en la anemia infecciosa de los equinos. **[Experiments on the transmission of equine infectious anaemia.]**—*Rev. Med. vet. Parasit., Caracas.* **4.** 59–60. **1977**

The causal agent of E.I.A. can remain alive in manure for five but not for ten days. Infection was produced through healthy conjunctiva in 19 days and through unbroken skin in 21 days. Only one experiment was performed in each case.
—R. MACGREGOR.

PETERS, J. T. (1945.) **Equine infectious anemia transmitted to man.**—*Ann. intern. Med.* **23.** 271–274. [Abst. in *Bull. Hyg., Lond.* **21.** 308, copied *verbatim*. Signed: A. J. RHODES.] **1978**

Equine infectious anaemia occurs relatively commonly in horses and mules in America and parts of Europe. The acute form may prove fatal in a few days and the subacute within 3 months, but both varieties may become chronic. The virus can be transmitted to horses experimentally by inoculation of a very small quantity of blood. Under natural conditions the infection is thought to be spread chiefly by the stable fly *Stomoxys calcitrans* and the mosquito *Anopheles maculipennis*. The disease is not generally regarded as being transmissible to man.

The author describes what is said to be the first case of human infection with this virus. The patient, a veterinarian who often came in contact with horses suffering from infectious anaemia, made the diagnosis himself by transmitting the infection to three horses by intravenous injection of 1 cc. of filtered [no details given] and unfiltered blood; the animals died of the disease.

The chief characteristics of the anaemia, which lasted for over two years before any improvement was noted were: Haemoglobin 4·3 gm. per cent., red count 2 million, colour index 0·8, M.C.H.C. 23 per cent., no nucleated red cells in peripheral blood, white count 1,800 to 2,600, no abnormal white cells, platelets normal except for many giant forms. No jaundice was detected.

It is suggested that certain cases of "idiopathic" aplastic anaemia in man may in fact be examples of infection with the virus of equine infectious anaemia.

[It would appear that the details of this case were first published in 1924 (*Pr. Méd.* v. **32** 105) by J. Th. Peters of Leydon. If so, it is strange that this point is not made clear in the text abstracted above, where no reference to the French paper is given.]

BOYNTON, W. H. (1945.) **Hog-cholera tissue vaccine (B.T.V.)**—*J. Amer. vet. med. Ass.* **106.** 16–18. **1979**

B.T.V. is a finely ground 20% suspension of swine fever-infected tissue in which the virus has been attenuated by the action of eucalyptol and a period of incubation at 37·5°C. The methods of assay of B.T.V. are identical with those of the standard crystal-violet vaccine. The duration of immunity with B.T.V. is three months. The risks involved with both vaccines are briefly described.
—M. L. LEVI.

GREEN, R. G., & STULBERG, C. S. (1946.) **Distemperoid virus interference in canine distemper.**—*Science.* **103.** 497–498. **1980**

The literature dealing with the interference phenomena in virus diseases of animals is briefly reviewed. The authors describe experiments made with a ferret-adapted strain of distemper virus from which they conclude that inoculation of distemper infected foxes with the ferret-adapted virus has a curative effect.

The foxes were infected intranasally with virulent virus. At intervals of 12 and three days after infection the ferret-adapted virus was injected intramuscularly into two groups of foxes; another group received the ferret-adapted virus simultaneously with the virulent virus and a control group had only the virulent virus. All the ten foxes in the control group died of typical distemper. In the group which received the ferret-adapted virus simultaneously with the virulent virus five out of ten foxes had some symptoms of

distemper, but all recovered promptly. In the group inoculated three days after infection two out of ten foxes had symptoms and both recovered. In the group inoculated 12 days after infection, four had symptoms and all recovered.—M. C.

NAI, D. D., & GARINEI, V. (1945.) Sull'attività terapeutica del siero iperimmune nella "epizoozia dei polli 1940". [**Therapeutic effect of hyperimmune serum in Newcastle disease.**]—*Clin. vet., Milano.* **68.** 21–23. **1981**

Hyperimmune serum was made by submitting a bird recovered from Newcastle disease to 5–10 inoculations of active virus. The bird was bled to death on the tenth day after the last inoculation. Birds receiving 1 ml. of its serum were protected against virus administered 48 hours previously. One bird, with a rise of temperature, recovered after receiving 2 ml. of the serum. Birds with marked symptoms did not recover.—R. MACGREGOR.

GARINEI, V. (1945.) Nella "epizootia dei polli 1940" l'immunità non viene trasmessa da madre a figlio. [**Lack of transmission of immunity through the egg in Newcastle disease.**]—*Clin. vet., Milano.* **68.** 18–20. **1982**

Chicks hatched from eggs laid by birds that had recovered from Newcastle disease 5–7 months previously were infected with virus at one and two months of age all died.—R. MACGREGOR.

CUNHA, R., WEIL, M. L., BEARD, D., TAYLOR, A. R., SHARP, D. G., & BEARD, J. W. (1947.) **Purification and characters of the Newcastle disease virus (California strain).**—*J. Immunol.* **55.** 69–89. **1983**

A Californian strain of Newcastle disease virus was concentrated by ultra centrifugation from infected chorio-allantoic fluid. Electron micrographs of the concentrate showed sperm-like particles which were considered to be the virus. These particles possessed a rounded or oblong head and a broadly attached tail which tapered smoothly. The approximate measurements were, width of head 70 mμ, length of head 180 mμ and length of tail 500 mμ. There was evidence of internal structure in the virus particle. The haemagglutinative activity of the concentrate was proportional to its infectivity for chick embryos.

Preliminary chemical analysis indicated that the virus consisted of protein (67%) with which was associated a relatively small amount of nucleic acid and lipoid (27%).—F. D. ASPLIN.

BRIODY, B. A., Jr. (1946.) **Haemagglutination induced by viruses.**—*Yale J. Biol. Med.* **19.** 29–61. **1984**

Fowl erythrocytes rendered refractory to haemagglutination by influenza virus remained sensitive to agglutination by vaccinia virus.

On the evidence from many experiments it was concluded that no samples of adult or embryonic fowl cells were completely resistant to vaccinia virus-induced haemagglutination. Embryonic red blood corpuscles were much less sensitive than adult cells.

It was suggested that the action of antiserum in inhibiting haemagglutination by virus might be brought about either by the combination of virus and antibody or by the coating of virus receptors by the serum.

Chamberland L_5 filtrates of influenza virus proved better inocula for virus production in eggs than concentrated unfiltered virus suspensions.

—F. D. ASPLIN.

DUFF, G. L., & CORBETT, E. (1945.) **Cytoplasmic inclusion bodies in the pancreas and salivary glands of small laboratory animals.**—*Proc. Soc. exp. Biol., N.Y.* **59.** 99–103. **1985**

The inclusions were found in rats, mice and rabbits from four separate healthy colonies in McGill University. They resembled the inclusions found in infectious ectromelia of mice, which, however, occur in the skin, intestinal glands and salivary glands, as well as in the pancreas. In the present series, occurrence at the salivary site was not observed in mice but only in rats. There was no disturbance of health and no sign of dietary deficiency. No correlation with secretory activity could be demonstrated in animals treated with atropine or pilocarpine. Inclusions were most abundant in animals killed in May or June. They occurred in clusters in the acinus cells of the pancreas and were 15–20μ in diameter and usually eosinophilic. The authors favour a virus origin for these structures.—J. B. B.

RACKER, E., & KRIMSKY, I. (1946.) **Inhibition of phosphorylation of glucose in mouse brains by viruses and its prevention by preparations of diphosphopyridine nucleotide.**—*J. exp. Med.* **84.** 191–203. **1986**

Inhibition of glycolysis occurs in cell-free homogenates of brains injected with poliomyelitis virus, with glucose or fructose—and phosphate as substrate. Purified preparations of virus inhibit glycolysis when added to homogenates of normal brain. A less consistent effect is produced by the addition of high concentrations of non-neurotropic viruses (influenza A and tobacco mosaic virus). The inhibition of glycolysis in the brains of mice infected by poliomyelitis virus is prevented by the addition of diphosphopyridine in the presence of glucose.—J. M. ROBSON.

See also absts. **1942** (salmonella types in swine fever and swine pox), **2043** (laryngo-tracheitis), **2116** (rabies and penicillin), **2117** (bovine broncho-pneumonia), **2118** (distemper), **2119** (avian encephalomyelitis), **2120** (infectious hepatitis), **2121** (chemotherapy), **2172** (rinderpest, foot and mouth disease, African horse sickness, etc., in Kenya), **2176** (lymphomatosis in fowls).

IMMUNITY

IPSEN, J., & ROSTOCK, O. (1945–46.) **A provisional standard for staphylococcus B antitoxin.**—*Bull. Hlth Org. L.o.N.* **12.** 390–393. **1987**

The authors were requested by the Permanent Commission on Biological Standardization of the League of Nations to prepare a dry stable preparation of staphylococcus β-antitoxin.

A seven-day culture of a strain of staphylococci which produced strong β—but no α—toxin was formolized until completely inactive against sheep cells. This preparation was used to hyperimmunize 50 rabbits. The sera from these 50 rabbits were pooled and distributed into ampoules of 5 ml. and 10 ml. with precision burettes. The ampoules were dried over calcium chloride and silicium hydroxide for six weeks when a constant weight was obtained.

The dry contents of three ampoules of 10 ml. and six ampoules of 5 ml. were then assayed. The weight of 1 provisional unit (P.U.) [SMITH & PRICE, 1938] was found to be 2·623 mg. ± 0·023 mg.

Solutions of the serum in 0·1% merthiolate saline were prepared so that 1 ml. contained 20 provisional units and the containers were labelled *Standard Staphylococcus Antitoxin β.*

The preparation contains practically no α-antitoxin.—ANGUS FOGGIE.

PHILIPS, F. S., HOPKINS, F. H., & FREEMAN, M. L. H. (1947.) **Effect of tris(beta-chloroethyl)amine on antibody-production in goats.**—*J. Immunol.* **55.** 289–296. **1988**

Since it has been established that nitrogen mustards have lymphocytotoxic and granulocytotoxic effects, it was thought that a study of their action might throw some light on the importance of the lymphocyte in the formation, storage and release of antibodies. Accordingly, adult goats were immunized against ricin and when the serum antibodies had reached a maximal level, the antigen was withheld for 6–8 weeks. After this time a single stimulating dose of ricin produced a rapid increase in the circulating antibodies. If, however, the immune goats were given small, sublethal doses of tris(beta-chlorethyl)-amine before the administration of the stimulating dose of ricin there was a delay in the rise of circulating antibodies and in some cases even a decrease when compared with control animals. The authors conclude that the effect is due to a direct toxic action of the substance on leucopoetic tissue.—J. A. NICHOLSON.

See also absts. **1916-1919** (anthrax), **1924** (BCG vaccine), **1928** (auro-tubercular compound for TB. immunization), **1933** (pasteurella infection in cattle and buffaloes), **1934** (attenuated vaccine for fowl cholera), **1946** (anaphylactoid reaction after antityphoid injections), **1948** (opsonic index in contagious abortion), **1950, 1951** (in brucellosis), **1954** (anaculture for control of enterotoxaemia in sheep), **1955, 1956** (tetanus antitoxin), **1967** (foot and mouth disease culture vaccine), **1970** (influenza antibodies), **1971, 1972** (rabies vaccines), **1979** (swine fever tissue vaccine), **1980** (interference phenomenon in distemper vaccination), **1982** (egg transmission of immunity in Newcastle disease).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

TEN HOOPEN, W. (1945.) De wolschurft (dermatocoptes van het schaap. Klinische les. **[Sheep scab.]**—*Tijdschr. Diergeneesk.* **70.** 285–288. **1989**

The author gives a detailed clinical description of sheep scab as it occurs in woolled sheep and outlines the procedure to be adopted in examining animals for scab and demonstrating the mites in the lesions. In cases in which legal proceedings are to be instituted against owners for neglecting to notify an outbreak it is imperative that at least one living mite must be recovered from an animal in the flock. In black sheep the black pigment of the wool renders the preparations, obtaining by boiling the crusts in 10% caustic potash, less transparent and the mites are not readily detected. It is not stated in veterinary literature why black fleeced animals are, as a rule, less affected than the light coloured animals. The author attributes this to the greater absorption of the heat of the sun's rays by a black fleece than by a white one. The excessive heat would seem to be detrimental to the development of the parasites.

Lice, ticks and grass awns may cause itching and breaks in the fleece suggesting scab and a microscopic examination of skin scrapings will be necessary to negative the mites. Although curative treatment is not discussed the author stresses the importance of treating the whole animal and not only the affected parts of the body. Scab in the improved breeds of sheep with fine fleeces yields less readily to treatment than in the breeds with a coarse fleece.—P. L. LEROUX.

NÖRR, J. (1944.) Ueber die Lebensweise der Chorioptesmilben und ihre deutsche Benennung. **[The life cycle of the *Chorioptes* mite and its German name.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* March 17th. 93–94. **1990**

This consists of a discussion, in the light of existing knowledge, on the mode of life of the three kinds of *Chorioptes* mites found on horses, and attempts to clarify the situation concerning

the way in which these mites obtain their nutriment. In view of present knowledge on this subject, the unsuitability of the customary German name for the *Chorioptes* mite (*schuppenfressende Milbe*) is pointed out and a new name (*Nagemilbe*) suggested.—L. Davies.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

I. Harrell, G. T., & Horne, S. F. (1945.) **Trichinella skin tests in tuberculosis sanatoriums, hospitals for mental diseases, and general hospitals. A comparison of the results in tuberculous and non-tuberculous patients.**—*Amer. J. trop. Med.* **25.** 51–58. **1991**

II. Davis, O. T., Harrell, G. T., & King, E. S. (1945.) **The effect of simultaneous tuberculous infection on experimental Trichinella infestations in guinea pigs.**—*Amer. J. med. Sci.* **209.** 758–764. **1992**

I. The discovery that patients with TB. in American hospitals had a higher incidence of infestation by *Trichinella spiralis* than normal, led to an investigation in order to explain the apparent association between *M. tuberculosis* and *Tr. spiralis* and determine whether any unrecognized sub-clinical epidemic or biological factors were involved.

A total of 1,586 patients, 674 tuberculous and 912 non-tuberculous, were subjected to a skin test to determine the presence of trichinosis. This consisted of an intradermal injection of a 1 : 10,000 dilution of trichinella extract, into the forearm. A second intradermal injection of a phenolized phosphate saline solution was administered into the other forearm as a control. A positive reaction was indicated by the degree and extent of erythema appearing 20 min. and 24 hours after the inoculation. 280 positive reactions were recorded, analysis of this figure revealed that 18·3% were tuberculous patients and 17·2 non-tuberculous. Unfortunately this result was complicated by the discovery that some mental patients, who comprised the bulk of the non-tuberculous group, gave an abnormal response to the injections.

Other factors revealed by the investigation were that race, sex and residence in urban or rural areas, were of no significance and the incidence of positive skin tests decreased with age.

II. Thirty-three g. pigs were divided into four groups. Group 1 received equal doses of the larvae of *Tr. spiralis*, using predigested muscle from an infected rat, Group 2 received injections of approximately equal doses of *M. tuberculosis*, Group 3 received both trichinella larvae and injections of *M. tuberculosis* and Group 4 acted as controls.

All the animals used had been previously tested for both TB. and trichinosis and found free from both complaints. Twelve weeks after administration of the infective doses, all g. pigs were destroyed. Results were assessed by the collection of smears from tuberculous lesions, which after staining with Ziehl-Neelsen, were recorded with reference to the Gaffkya scale. In the case of trichinosis, the diaphragm was pressed between glass plates and examined microscopically.

Interpretation of the results indicated that the trichinella infestation was markedly increased in Group 3, which received the dual infection. The intensity of the infestation was 1,600 times that recorded from the non-tuberculous group. There was no significant difference in the degree of TB. in the various groups.

The authors conclude that there is evidence to suggest that tuberculous patients can become infected with smaller doses of *Tr. spiralis* than normal subjects. The converse did not apply: the intensity of *M. tuberculosis* infection was the same in both trichinosed and normal groups.

—D. W. Jolly.

See also absts. **2157** (fixation of trematodes), **2171** (phenothiazine in salt-licks), **2172** (cysticercosis in Kenya), **2175** (*Thysanosoma actinoides*, various parasites of pigs, *Subulura brumpti*, etc., in U.S.A.)

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIA [INCLUDING FOWL PARALYSIS]

Täubler, C. J., & Pires, A. (1945.) Contribución al estudio de los colesteatomas de los plexos coroides de equinos. **[Cholesteatoma of the choroid plexus in the horse.]**—*An. Fac. Med. vet., Univ. la Plata.* **8.** 89–106. [English, French and German summaries.] **1993**

The authors record cholesteatoma of the choroid plexus in three horses. On this basis they have written a monograph describing the histology, incidence and chemical constitution of the tumours, together with an account of the clinical symptoms in affected animals and the sequelae of the disease.—I. W. Jennings.

Laszlo, F. (1943.) Knorpelhypoplasie in der Nasenscheidewand bei einem Pferd. **[Hypoplasia of the nasal septum in a horse.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 214. **1994**

A growth the size of a hazel nut was located in the lower third of the nasal septum of a horse. It was completely surrounded by normal cartilage and, although elastic, was much whiter than the septum. Sections revealed a normal perichondrium around areas of cartilaginous tissue separated by spaces. The cell type was atypical and corresponded closely with the type of cell found in the nasal septum of the embryo. Differential diagnosis is discussed.—C. W. Ottaway.

Lindsay, S., & Gilmore, J. W. (1946.) **Primary splenic endothelial sarcoma in a dog.**—*J. Amer. vet. med. Ass.* **109.** 194–197. **1995**

A case of primary endothelial sarcoma of the spleen of a dog is described. This is an uncommon neoplasm and details are given of the gross and microscopic structure. The one described appeared to be of low grade malignancy and there was no evidence of metastasis.—A. R. Jennings.

Esmarch, O. (1942.) **The guinea-pig as experimental animal in cancer research.**—*Acta path. microbiol. scand.* **19.** 100–107. [In English. Author's summary copied *verbatim.*] **1996**

In 3 of 10 guinea-pigs which had received subcutaneous injections of 10 mg. of methylcholanthrene, sarcomas developed at the site of injection after an experimental period of from 13 to 21 months. In 4 of 10 animals in which the substance had been deposited intraperitoneally, sarcomas developed in the abdominal cavity after 13 to 18½ months. One of the tumors was successfully transplanted to other guinea-pigs.

Crabtree, H. G. (1946.) **Some effects of aromatic hydrocarbons on sulfur metabolism and tumor induction in mice.**—*Cancer Res.* **6.** 553–559. **1997**

The study of sulphur metabolism has been associated with three aspects of cancer research: (1) the effect of sulphur deprivation on the percentage incidence of spontaneous mammary tumours in susceptible strains of mice, (2) the growth-retarding influence of carcinogenic hydrocarbons and azo dyes fed to young rats and (3) the discovery that substances which specifically lower the local level of sulphur metabolism, tend to check skin tumour induction.

C. brings forward evidence to show that mercapturate-forming hydrocarbons oppose the biological action of carcinogenic hydrocarbons. He points out that the metabolic transformation of carcinogenic hydrocarbons so far recorded are all of an oxidative character and are possibly concerned with eliminative processes. Intermediate phases of these detoxication reactions may be the initiations of carcinogenic action and sulphur may play a role in the fixation of any such potent derivatives within cells as a preliminary to their malignant transformation.

Carcinogens administered by injection or skin painting have failed to give any evidence of sulphur utilization at the site of application or in their metabolic end products. On the other hand, the mercapturate-forming hydrocarbons, naphthalene, anthracene and phenanthrene cause significant changes in urinary sulphur partition and skin glutathione content. These substances when applied to the skin in conjunction with 3,4-benzpyrene and 1,2,5,6-dibenzanthracene reduced the rate of tumour induction in mice.—J. G. C.

Taylor, A., & Carmichael, N. (1947.) **Stromal malignancy in mouse-grown transplants of egg-cultivated mouse mammary carcinoma.**—*Cancer Res.* **7.** 78–87. [Authors' summary copied *verbatim.*] **1998**

A mammary carcinoma from a dba mouse (dba mammary carcinoma 1) has been cultivated continuously in eggs for 2 years and 11 months or 90 transplant-generations. During that period, there has been no observable change in the histology of the tumor tissue. The stroma of these egg-grown tumors is chick tissue.

Implants of the egg-grown mammary carcinoma into mice resulted in mixed carcinoma-sarcomas in 38 per cent of the first mouse transplants. The new tumor-type usually arose as isolated patches in the stroma which in subsequent generations coalesced, dividing and encircling the original carcinoma. The proportion of the transplants containing sarcomatous tissue increased with further transplant-generations in mice. A total of 186 experiments involving the use of 2,440 mice were used in the study.

Sarcomas produced in this manner were of different cell origins, varying growth rates and cytological characteristics. Many contained giant cells, nuclear debris, and unusual mitotic aberrations.

When egg-grown tumor is implanted back into the mouse, the stroma of the resulting tumor is composed of mouse tissue. It is concluded that the induction of malignancy in normal cells of the stroma is due to contiguity with the cancer cells of the implant, and consequent infection with the tumor agent or virus.

The process is considered to be essentially the same as that involved in the production of malignant tumors by injection into the mouse of cell-free extracts of materials from mouse tumor-bearing eggs.

*Kubowitz, F., & Ott, P. (1943.) Isolierung und Krystallisation eines Gärungsfermentes aus Tumoren. [**Isolation and crystallization of an enzyme from tumours.**]—*Biochem. Z.* **314.** 94–

117. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 256–257.] **1999**

By extraction of Jensen sarcomas of rats with distilled water at 0°C., precipitation with acetic acid and elution with NaCl solution, an enzyme preparation was obtained which was further purified, yielding a crystalline protein enzyme. Pyruvic acid and dihydropyridine nucleotide were used as substrate to test the enzyme preparation. A similar enzyme in crystalline form was obtained from muscle. The action of ultraviolet light, heat or duodenal secretions destroyed the enzymic activity. Injections of the proteo-enzyme into rabbits were antigenic ; the plasma of rabbits was found to inhibit the enzymic activity.—E. K.

*Beeson, F. W. (1944.) **The leucosis complex —and its control.**—*Feedstuffs* [*Minneapolis*]. **16.** No. 43. 46–50. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 4, 37, copied *verbatim.* Signed : E. B. McQuarrie.] **2000**

The leucosis complex, a group of diseases including paralysis, blindness, big livers, and ovarian tumors, is considered the worst scourge of the poultry industry. The author, on the assumption that the disease was caused by molds, entirely eliminated it from his flocks, earlier infected, by incorporating $CuSO_4$ in the diet. 1 oz. of $CuSO_4$ per ton of feed was used until the birds were 12 weeks old ; 2 oz. per ton was then used to age of maturity.

See also absts. **2035-2037** (" bouhite "—malignant pulmonary lymphomatosis—in sheep).

DISEASES [NON-INFECTIVE] OF BREEDING STOCK

Wishart, D. S. (1946.) **Artificial insemination of cattle. Werribee District Unit.**—*J. Dep. Agric. Vict.* **44.** 375–377. **2001**

In 1945, following preliminary investigations over the previous two years, an artificial insemination unit was established in commercial dairy herds of grade cows in the Werribee district of Victoria. The semen used was collected from Stud Friesian bulls located at the State Research Farm, from which centre the unit was operated. The purpose of the project was to provide information regarding the organization required for a full scale commercial unit and the degree of efficiency which might be expected in such a unit.

An analysis of the preliminary results of the insemination of the first 250 cows is given. It is pointed out that these results are not final, as up to the time of writing few calves had been dropped from the cows concerned.

The conception rate was given as 1·68 inseminations per conception, or, when conceptions were expressed as a percentage of total inseminations, 59·7. Two factors, tending possibly to cancel each other, probably modify these figures, *viz*, (1) some cows were moved to " dry " paddocks before it could be determined that they were pregnant, (2) no attempt was made to restrict the number of inseminations given to any one cow. No attempt was made, either, to treat or eliminate cows difficult to get into calf. Thus, included in these preliminary figures were a number of inseminations of cows which might never conceive.

It was found that, by diluting with egg-yolk-phosphate buffer, providing careful selection of original specimens of semen (*i.e.*, as collected) was carried out, successful inseminations could be achieved at least four days after collection. Dilution of semen up to 1 : 24 did not in any way diminish the percentage of successful inseminations.

Comparison of results of insemination of cows on the day on which they were first observed on heat, or on the day following, revealed little difference in percentage conceptions. This is considered as providing evidence to justify the principle of a once daily, as compared with a twice daily, insemination service.—C. S. Sapsford.

Mies, A., filho. (1943.) Inseminação Artificial. [**Artificial insemination.**]—*Bol. Minist. Agric., Rio de J.* **32.** No. 11. 47–66. **2002**

After reviewing briefly the history of artificial insemination from 1670 until the present time, M. enumerates the methods of collecting seminal fluid. These include manual stimulation of the penis in the dog, rectal massage of seminal vesicles in the bull, the introduction of a sound into a urethral fistula, the use of a rubber collecting bag and electrical stimulation. Male birds respond to massage of the soft parts of the abdomen, or semen may be collected by fixing a special apparatus over the cloaca just before normal copulation. Other methods depend on collecting semen from the vagina of the female animal or from an artificial vagina used either in conjunction with the female or with a dummy animal.

Examination of semen is dealt with briefly. Some of the abnormalities which M. noticed included ammoniacal smell due to the presence of urine, red colour due to fresh blood, greenish colour due to pus, bluish or reddish colour when such drugs as methylene-blue and phenothiazine were being eliminated *via* the kidneys. Diluting and preserving fluids are discussed shortly.

For purposes of insemination, M. divides

animals into three types, *i.e.*, those in which copulation is vaginal, as in ruminants and rabbits, those in which it is uterine, as in equines, swine and dogs, and those in which it is tubular, as in birds. The quantity of fluid necessary for insemination varies with each type.

The various advantages of artificial insemination, medical and economical, are discussed, and the article concludes with a short résumé of the progress of this method of reproduction in various countries throughout the world.—I. W. JENNINGS.

FOURNIER. (1944.) Surmenage des étalons : fausse stérilité des juments. [**Excessive use of stallions, a cause of apparent infertility in mares.**]—*Rec. Méd. vét.* **120.** 65–66. **2003**

F. considers that sterility in mares is relatively uncommon and that infertility is generally due to the use of stallions which are grossly overworked. Cases in support of this contention are cited.

—ALFRED T. COWIE.

I. ANDERSON, J. (1946.) **The buffer capacity and the specific gravity of bull semen.**—*J. agric. Sci.* **36.** 258–259. **2004**

II. ANDERSON, J. (1946.) **The sugar content of bull semen and its reduction during storage.**—*Ibid.* 260–262. **2005**

Observations on certain physical properties of bull semen indicated that there was a significant positive correlation between buffer capacity and sperm motility and a highly significant negative correlation between buffer capacity and pH values, but that there was no correlation between the buffer capacity and the volume of the ejaculate or the concentration of the sperm. A higher buffer capacity was observed in samples which maintained a motility of 70% or more on storage.

The mean specific gravity of 125 semen samples was 1·0337. A highly significant positive correlation was found between the specific gravity and the concentration of spermatozoa and the percentage motility, and a highly significant negative correlation between pH and specific gravity. There was no constant relationship between specific gravity and the volume of ejaculate or the pH change. In general better motility on storage was related to the higher specific gravities, and the higher the specific gravity the lower was the pH and the better the buffer capacity of seminal fluid.

II. Determinations of the sugar content of 239 samples of fresh bull semen by Somogyi's modification of the Shaffer-Hartman method gave a mean value of 470·5 ± 11·7 mg. %. There was no relationship between the sugar content and the volume of the ejaculate, or the concentration of the sperm, the initial motility and the maintenance of high motility during storage. Undiluted semen stored at 10°C. for 24 hours had an average reduction in sugar content of 23·85 ± 1·76% of the initial value.

The correlation between sugar reduction and initial motility was positive and significant, with a highly significant positive correlation between sugar reduction and the concentration of sperm. There was a negative correlation not significant, between sugar reduction and the period for which good motility (70% or more) was retained on storage.—A. EDEN.

SORENSEN, E. (1946.) **Insemination with gelatinised sperm in paraffined cellophane tubes.**—*Vet. J.* **102.** 235–237. **2006**

Sperm is diluted with a phosphate glucose gelatin mixture, to which is added 10% egg-yolk to aid preservation. A cellophane tube (commercial ice cream soda straw) is coated with paraffin, sucked full of liquid diluted sperm (standing at blood heat in a water bath), laid out on paper for the gelatinized suspension to solidify and plugged with paraffin at the end. For insemination, S. uses a self-designed instrument on the principle of the balling gun, by which the sperm on liquefying is expelled from the straw tube into the cervix. Since 1940 this method has been used by most veterinary surgeons carrying out artificial insemination in Denmark and results are claimed to be good. [No figures of conception rates are supplied.]—F. L. M. DAWSON.

RUBIN-ZAMORA, H. (1945.) La inseminación artificial en el trópico. [**Artificial insemination in the tropics.**]—*Cuad. verd. 3a interamer. Agric., Caracas.* No. 48. pp. 28. Caracas : Editorial " Crisol ". **2007**

The author believes that the introduction of an efficient artificial insemination service into Venezuela would improve the standard of cattle immensely in a short time—in five years a standard could be reached which would take 40–50 years in the course of national reproduction.

In Venezuela, the high temperature, lack of water and poor summer feeding tend to reduce the sexual appetite of the breeding bulls, to lower the concentration of sperms and the pH of the semen and to raise the number of abnormal sperms present. These difficulties can be overcome by keeping high quality breeding bulls on the best pastures and providing them with plenty of water and the best of food. Semen can then be transported for long distances throughout the country. Experiments showed that seminal fluid could survive at least 49 hours at a temperature of 6·5°–8°C. in a suitable diluting fluid. Artificial insemination trials already carried out have proved highly successful.—I. W. JENNINGS.

KRALLINGER, H. F. (1943.) Einige ergänzende Gesichtspunkte zur Beurteilung und Anwendung der künstlichen Besamung. [**The critical judgment and use of artificial insemination.**] —*Züchtungskunde.* **18.** 131–139. **2008**

The increased number of progeny which may be obtained from one bull by the use of artificial insemination is considered to be of great advantage since the likelihood of breeding an animal homozygous for desirable genes is increased.—C. A.

I. PESSOA, A. S. (1941.) A inseminação artificial nos galináceos. [**Artificial insemination of fowls.**]—*Rev. Med. vet., Lisboa.* **36.** 154–187. **2009**

II. PESSOA, A. S. (1942.) Breves considerações àcêrca da inseminação artificial nos galinácoes. [**Artificial insemination of fowls.**]—*Bol. pec., Lisboa.* **10.** No. 1. 35–41. **2010**

I. The electrical method of Serebrovsky modified by Letard and Tinet is recommended, *i.e.*, with a needle inserted over seventh lumbar vertebra (+) and a pair of pincers (—) over the shoulders and a current of 110 volts dropping to 30 volts in 3 sec. Nine applications are given with intervals of 7 sec., followed if necessary by one of 5 sec. and one of 10 sec. with a 2 min. interval. Sperm so obtained remains alive for eight days losing only 32% fecundity. Dilution 1 : 1 or 1 : 2 in Ringer's improves its fecundity. There is a risk of killing the bird and the method is not advocated for general use.

Insemination is by a pipette or 1 ml. syringe direct into the cloaca or, better, into the oviduct exposed by everting the cloaca ; a dose of 0·5 ml. is sufficient. Sterile eggs may also be fertilized through an opening in the shell, taking care not to touch the yoke.

II. A summary of I, above.—R. MACGREGOR.

LUBIN, E. D. (1946.) **Equine gonadotropin in the functional sterility of dairy cattle.**—*J. Amer. vet. med. Ass.* **109.** 352–354. **2011**

Forty-eight cows were treated. In each case the animal was not bred at one oestrous period and was injected subcutaneously 16 days later with 15–25 ml. pregnant mare's serum. The animal was then bred in the subsequent heat period. Thirty-eight animals became pregnant and six of them had multiple pregnancies, including two sets of triplets. Occasionally undesirable effects were produced, *viz*, retained corpus luteum (two cases) and incurable multiple cysts (two cases). —J. M. ROBSON.

WYSSMANN, E. (1946.) Über Vaginalzysten und deren Bedeutung beim Rind. [**Vaginal cysts in cattle.**]—*Schweiz. Arch. Tierheilk.* **88.** 589–596. **2012**

Bovine vaginal cysts are mainly retention cysts of Bartholini's glands and only rarely of other mucous glands or Gartner's canal. They occur mostly on the left vaginal wall and nearly always in cows after parturition or various inflammatory conditions.

The interference of the vaginal cysts in fertilization, conception or parturition is small and depends on their size.—C. AHARONI.

GALLO, P. (1942.) Observaciones sobre la esterilidad bovina en el trópico. [**Bovine sterility in tropical countries.**]—*Rev. Med. vet. Parasit., Caracas.* **4.** 69–74. **2013**

Among half-bred cattle on free range, sterility is usually due to malnutrition, especially during long droughts, but shortage of calcium or iodine is sometimes the cause. Imported pure-bred cows kept in stables are usually sterile as the result of disease of the genital organs. Imported pure-bred bulls are often rendered impotent by malnutrition, as it is not realized that a bull requires a " reproductive " ration in addition to the maintenance diet. Occasionally such a bull may be spoiled by ranging free with the cows, when he will serve each one several times during heat and overstrain his powers. If a nymphomaniac cow is present, this is very likely to happen. —R. MACGREGOR.

BENESCH, F. (1944.) Erkrankungen der Cervis als Sterilitätsursache beim Rind. [**Pathological changes in the cervix uteri as a cause of sterility in cattle.**]—*Berl. Münch. tierärztl. Wschr./ Wien. tierärztl. Mschr.* Sept. 29th. 314–315. **2014**

Pathological changes in the cervix uteri associated with sterility fall into three groups. The first includes cases of reddening of the cervical orifice, without obvious discharge, which may indicate the presence of conditions varying from cervicitis to chronic endometritis. The second group includes cases with marked cervical reddening and swelling. The appearance does not necessarily indicate acute endometritis and pregnancy can occur. The third group is composed of cases with marked cervical deformations, such as duplication of the cervix and a condition in which thick folds of tissue span the external orifice, lying dorso-ventrally and causing the appearance of slit-like openings into the canal. The former condition was observed in 23 and the latter in 72 cases during a mass survey of 19,320 cattle. Twenty-one of the 23 animals with cervical duplication had given birth to two live calves. Most of the 72 cases with cervical bands were pregnant or, even if now sterile, had a history of previous pregnancy.—E. F. MCCARTHY.

KNÜSEL, F. (1945.) Über die Entzündung des Gebärmutterhalses und des Muttermundes (Cervicitis) beim Rind. [**Inflammation of the neck and orifice of the bovine uterus (cervicitis).**]—*Schweiz. Arch. Tierheilk.* **87.** 546–550. **2015**

The commonest cause of cervicitis seems to be chronic endometritis. Injury and rupture of the mucosa and submucosa during parturition may facilitate bacterial infection of the cervix and thus create a primary cervicitis. Cervicitis due to *Trichomonas* infection and TB. are also encountered. Rectal or vaginal examination only rarely furnishes an exact picture of the condition.

According to BENESCH [see abst. preceding] cervicitis can be classified as (a) slight, with inflammations recognized with the use of the speculum and a lamp, or by pulling out the cervix with special forceps and in which there is reddening of the cervical folds and only scanty secretion from the cervical canal; the lumen of the canal may be narrowed and the cervix slightly enlarged, but rectally no changes can be palpated, and (b) severe, with swelling of the cervical folds and a dark red colour, exuberant growth and enlarged folds seen *per vaginam* and the cervical circumference as thick as an arm when felt *per rectum*. In severe cases the hypertrophy extends deeply into the muscular layer. Vaginitis and nymphomania are often additional features in both groups.

Out of 1,000 cases of sterility seen by K., cervicitis was diagnosed 126 times as the sole pathological condition present. The toxic effect of the secretion probably weakens the motility and vigour of the sperms, quite apart from the mechanical hindrance caused by the narrowed lumen and the swollen folds.

Treatment presupposes a possible endometritis. The well-known iodine lavages, 1–2 ml. of yatren dropped directly on the cervix and 5 ml. yatren injected into the cervical parenchyma, are recommended, as well as oestron injections. Artificial insemination can be used in very persistent cervicitis, provided the uterus is clear.

Lately the introduction of sulphonamides into the cervical canal has been tried, as this method has shown very good results in human cases, the necessary tamponing was not satisfactory, however, and the following combined treatment was carried out: intra-parenchymatous injection of yatren E 104; rubbing of the os and massage with cotton wool soaked in iodine-benzene of the posterior parts of the canal, drawn out by forceps; intra-parenchymatous injection of 10 ml. cibazol [sulphathiazole] solution.—C. A.

WATKINSON, G., MCMENEMEY, W. H., & EVANS, G. (1947.) **Hypopituitarism, hypogonadism and anaemia treated with testosterone.**—*Lancet.* **252.** 631–634. [Authors' summary copied *verbatim*.] **2016**

Two cases of anaemia, one microcytic and one macrocytic, complicating pituitary and gonadal deficiency, conform to previous descriptions but are unusual in their lack of response to simple therapy with iron, liver, or thyroid, and in their dramatic response to testosterone propionate. The relation of the gonads to erythropoiesis is reviewed, and a hypothesis is advanced of their mode of action.

Two further cases of refractory anaemia were also given testosterone; in one, a case of primary focal myelofibrosis, testosterone induced a temporary remission, as has been reported by other workers; in the second case, one of achrestic anaemia, it did not exert any beneficial effect.

The evidence produced shows that hypogonadism may be important in the production of anaemia, and testosterone may have a good effect in cases of this type.

WILLIAMS, W. L., GARDNER, W. U., & DEVITA, J. (1946.) **Local inhibitions of hair growth in dogs by percutaneous application of estrone.**—*Endocrinology.* **38.** 368–375. **2017**

Small amounts of oestrone (2–6 mg.) which do not produce growth of the nipple, were applied locally every day for several weeks to shaved or clipped areas of the skin of three bitches. This inhibited the regrowth of hair in the treated areas, while control solutions (oil and alcohol) had no such effect. The partially restored hair of the oestrone-treated areas, when again removed immediately after the end of oestrogen treatment, returned at a much slower rate than did the hair of the control areas.—J. M. ROBSON.

BOURNE, A. (1947.) **Endocrines in gynaecology.**—*Brit. med. J.* Jan. 18th. 79–83. **2018**

This is a review of the introduction of the sex hormones into gynaecology, in which, it is stressed, few conditions can be cured with certainty. B. suggests that the subject has developed too rapidly and that the results of animal experiments have been applied too literally to human beings. He makes the important point that not only have adequate concentrations of a hormone to be present in the body, but the receptors in the organ to be affected must also be in a suitable condition; this has so far been insufficiently considered.—J. M. ROBSON.

HAMBURGER, C., & PEDERSEN-BJERGAARD, K. (1946.) **On the effect of gonadotrophins in normal infantile female guinea-pigs.**—*Acta*

path. microbiol. scand. **23.** 84–102. [In English.] **2019**

Infantile female g. pigs (175–200 g.) were injected with chorionic gonadotropin, pituitary gonadotropin, mare serum gonadotropin, and gonadotropin from a patient with malignant testicular tumour. Dose-response curves for the uterine and ovarian weights were obtained over a wide range of doses and were found to be similar for the various gonadotropins, as were the histological changes in the uterus and ovaries. The lower doses produced an increase in the uterine weight, but no effect on the ovarian weight; histologically there were enlargement of the antrum of the individual follicles and oestrous changes in the endometrium. With medium doses the uterine and ovarian weights were not increased and in the ovaries there was a pseudo corpus luteum formation with some luteinization of the enlarged follicles present. With high doses there was some increase in uterine and ovarian weight and the whole ovary had homogeneous luteinization. These curves were very different from those obtained in immature rats and the results emphasize the need for exact quantitative measurements, covering a wide range of dosage, in all studies on the effects of gonadotropins in female g. pigs.

—J. M. Robson.

Hamburger, C., & Pedersen-Bjergaard, K. (1946.) **Comparative studies on the effect of gonadotrophin on the rabbit ovary after injection into an ear vein and into a mesenteric vein.**—*Acta path. microbiol. scand.* **23.** 103–106. [In English.] **2020**

Injection of chorionic or mare serum gonadotropin into the mesenteric vein of rabbits produces the same effect on the ovaries as when the hormone is injected into an ear vein. The hormone produces no effect when injected into the lumen of a ligated segment of small intestines and no gonadotropin was recovered from the intestinal contents 40 hours later. It is concluded that the ineffectiveness of gonadotropin given orally is not due to its decomposition by the liver but to its destruction by the intestinal contents.—J. M. R.

Chamorro, A. (1945.) Le rôle de la corticosurrénale dans la stimulation mammaire. **[The adrenal cortex and stimulation of the mammary gland.]**—*C. R. Soc. Biol. Paris.* **139.** 989–991. **2021**

Adrenalectomy of castrated rats does not lead to any further atrophy of the mammary gland. Implantation of pituitaries from normal rats leads to an equal mammary response in castrated and castrated-adrenalectomized animals.—J. M. R.

Spörri, H. (1944.) Über physiologische Krisen während der Gravidität und ihre klinische Bedeutung. **[Physiological crises in pregnancy and their clinical significance.]**—*Schweiz. Arch. Tierheilk.* **86.** 236–245. **2022**

Incomplete sexual cycles, which occur in certain species, *e.g.*, in the mouse, in the bitch and in *Macacus*, may also occur during pregnancy. The uterus may then become more sensitive to various stimuli (mechanical, thermal, chemical) and this may lead to abortion.—J. M. Robson.

Veiga, J. S. (1945.) Membros flexionados—um fator hereditário sub-letal, recessivo simples, nas raças zebuinas Gir e Indubrasil. **[Flexed limbs, a simple recessive sub-lethal factor in Gir and Indo-Brazilian zebu cattle.]**—*Rev. Fac. Med. vet. S. Paulo.* **3.** 101–108. [Abst. from English summary.] **2023**

A sub-lethal, hereditary defect related to a single recessive factor is described as occurring in Gir and Indo-Brazilian cattle. The intensity of the defect, which takes the form of flexed pasterns in new-born calves, is variable: afflicted calves rarely live.

Twenty-five cows and 13 bulls were classified as carriers of this recessive factor. All defective animals examined were found to come from parents heterozygous for the recessive factor.

The author discusses the measures necessary for the control of this defect.

Landauer, W. (1946.) **The results of selection against expression of the "short upper beak" mutation in fowl.**—*Amer. Nat.* **80.** 490–494. **2024**

The recessive "short upper beak" mutation which results in death of the majority of embryos between the 18th and 21st days of incubation has been studied. The mutation was formerly classed as semi-lethal, as a certain variable proportion of affected chicks survived.

Survival is influenced by modifying genes and in the absence of all modifiers the mutation is completely lethal. By selective breeding from affected chicks the hatchability was increased over a period of five years from 39·2% to 77·0% the great majority of chicks having a normal beak at the time of hatching and most of those which had a slight abnormality at the time of hatching becoming normal later.—M. C.

See also absts. **2046** (nutrition and fertility in bulls), **2051** (effect of potassium iodide on spermatogenesis), **2059** (riboflavin requirements of breeding poultry), **2065** (blood groups and congenital diseases), **2072** (effect of temperature on sexual sterility), **2172** (subterranean clover and genital disorders).

DISEASES, GENERAL

TIMMES, J. J. (1946.) **Radiation sickness in Nagasaki. Preliminary report.**—*Nav. med. Bull., Wash.* **46.** 219–224. [Abst. in *Bull. War Med.* **6.** 435–436, copied *verbatim.* Signed: J. W. McLAREN.] **2025**

The effects of the atomic bomb differ from those of ordinary explosives only in its release of radiant energy. "The atomic splitting bomb dropped on Nagasaki was exploded at an estimated altitude of 800 feet." At this height much of the original energy was expended into the atmosphere, "with the probably anticipated result that the underlying terrain would not remain radioactive for a prolonged period". Subsequent investigation by X-ray films, buried in the bombed area, and attached to objects in the region where the atomic explosion had occurred, failed to reveal the presence of radioactive elements. X-ray films attached to the limbs of victims of the explosion also failed to reveal any radiation: this is explained by the fact that, although the patients had been exposed to forms of radiation energy, they did not absorb any large amounts. A large number of the patients examined, however, revealed true forms of radiation sickness, but only a few cases which could be classed as "X-ray skin burns" were noted, and these were mild in character. Many cases of partial alopecia were seen; some of these patients began to lose their hair 4 or 5 days after the explosion, while others first noticed this phenomenon in about the third week. The principal effect of the radiation was on the bone marrow, with a marked degree of depression of the marrow function. Most of the cases seen showed an aplastic type of anaemia. The blood was deficient in red blood cells and haemoglobin, and, as granulopoiesis was greatly impaired, agranulocytosis resulted. Petechiae were commonly seen, as were gross haemorrhages, and bleeding times were found to be increased. Many of the patients died as a result of terminal infection, particularly bronchopneumonia. Complete follow-up of cases was difficult, owing to the circumstances prevailing, and treatment was handicapped by shortage of supplies. Penicillin and plasma were used with beneficial results in some patients. In a few cases, liver extract seemed to be of value, but in general it was not very effective. Pentnucleotide was also considered to be efficacious in producing a progressive rise of the white blood cell count.

VERLINDE, J. D., & OJEMANN, J. G. (1946.) Eenige aangeboren misvormingen van het centrale zenuwstelsel. [**Deformations of the central nervous systems.**]—*Tijdschr. Diergeneesk.* **71.** 557–564. [Abst. from English summary.] **2026**

A number of anomalies of the central nervous system are described, *viz*, anophthalmia in a cat, microgyria in three cats, micropthalmia in a colt and a dog, heterotopia of the Purkinje cells in a cat, hypoplasia cerebelli in six cats and a dog, and spina bifida in a dog. In one of the cats a choreo-epithelioma was found in the plexus of a side ventricle. Hypoplasia of the cerebellum was accompanied by partial agenesia of the Purkinje cells and of the granular cells. There was deterioration of the Purkinje cells and atrophy of the cortex and of nerve tissues. In a dog a partial aplasia of the cerebellum was noticed. Three of the cats with hypoplasia cerebelli came from the same litter. All the animals, except those with anophthalmia and microphthalmia, had neurological symptoms, which, though the deformations were congenital, had not always been present from birth.

VAN RAADSHOOVEN, F. H. (1942.) Intestinale auto-intoxicaties bij paard en rund. [**Intestinal auto-intoxications in horses and cattle.**]—*Tijdschr. Diergeneesk.* **69.** 37–43 & 44. **2027**

Auto-intoxication due to the absorption of toxins formed by decomposing and fermenting proteins and carbohydrates in the intestine is discussed. The pathological lesions encountered in fatal cases were insignificant compared with the severity of the symptoms. The essential clinical features in the horse were sudden onset, temperature 40·8°C., pulse 80 and regular, respiration 60 and costo-abdominal, visible mucosa injected and dirty, mouth dry, meteorism absent and few borborygmi audible; rectal exploration reveals nothing abnormal: the intestines are not overfilled and faeces are soft and sour smelling.

A fatal case in a horse, with symptoms resembling those of "grass disease", is described.

In another case with similar symptoms an intravenous injection of a solution of Ca and Mg brought rapid relief and the animal recovered. Blood analysis gave Ca 9·8 (normal 13–14) mg. %, P 44 mg. % (high), Mg 2 mg. % (normal). These two cases seem analogous with grass tetany in cattle. *Botulismus*, a disease of horses in South Holland also appears to be due to auto-intoxication, because in these cases blood-letting, laxatives (arecoline and aloes), 24 hours' starvation and careful feeding gave excellent results.

Urticaria, mummification of the non-pigmented skin and acute lung emphysema in cattle may be due to toxins of intestinal origin. Other bovine diseases in which auto-intoxication seems to be involved are grass tetany, milk fever, apple-

poisoning (symptoms like those of milk fever, with a typical blood analysis and rapid recovery on intravenous injection of Ca and Mg solution) and *Lal* in calves fed on large amounts of milk and in older animals at pasture but receiving a supplementary feed of meal and milk by-products.

The author suspects that there may be other diseases of equines and bovines due to auto-intoxication and considers that death in foot and mouth disease is undoubtedly also due to auto-intoxication. Auto-intoxication in equines is characterized by a moderately high temperature and unrelated increase in pulse frequency. In bovines a much increased rise in temperature is accompanied by a slow pulse. The solution of these problems depends on close co-operation of the clinician and the veterinary chemist.

—P. L. Le Roux.

Jørgensen, J., & With, T. K. (1947.) **Acute porphyria.**—*Lancet.* **252.** 54–56. **2028**

A brief review, with a description of two cases illustrating the harmful effects of barbiturates on human beings with porphyria. [This disease in man resembles that described by Fourie & Rimington in South African cattle—see *V. B.* **9.** 256.]—M. L. Levi.

Rainey, J. W. (1946.) **Haemorrhage into the floating colon as cause of death in equine colic.**—*Aust. vet. J.* **22.** 153–155. **2029**

Three equine cases are described in which the outstanding autopsy finding was extensive haemorrhage into the floating colon. Only one horse was seen before death. The visible mucous membranes in each case were pale white. The cause of each case was attributed to the ingestion of clover, mouldy hay or parsnip refuse. R. suggests that an allergic reaction may be responsible for the condition.—J. D. Steel.

Phillips, R. (1946.) **Some aspects of wastage and losses in cattle.**—*J. Min. Agric., Lond.* **53.** 246–249. **2030**

Examination of data from various sources, including several knackeries, has shown that the highest incidence of losses in cattle occurs in the spring months. This is considered to be due to the cumulative effect of a low plane of nutrition for 5–6 months in late autumn and during the winter. Various methods of reducing these losses are discussed, including pasture improvement, provision of winter forage crops, and the use of mineral supplements.—D. D. Ogilvie.

Vogelsang, E. G. (1942.) Insuflación de aire por vía intravenosa en bovinos. [**Intravenous insufflation of air into cattle.**]—*Rev. Med. vet. Parasit., Caracas.* **4.** 75–78. **2031**

Seven cattle were injected intravenously with quantities of air varying from one to 20 litres. The only change noted clinically was a temporary dyspnoea. Animals slaughtered eight hours after the injection appeared normal except for the presence of frothy blood in the right heart and great vessels. One animal slaughtered four days after insufflation still had bubbles of air in the right heart, but there were none in the heart of an animal slaughtered ten days after insufflation.

—I. W. Jennings.

Amos, A. (1946.) **Indigestion and scour in calves.**—*Agriculture, Lond.* **52.** 535–536. **2032**

Reference is made to an earlier (1934) study by Sheeby in which he showed that if new born calves were fed on whole milk from cows which had calved several months previously indigestion, scouring and sometimes death resulted, owing to the formation of hard milk curd in the abomasum. Dilution of the milk with 25% water prevented this. Milk from freshly calved cows contained considerable quantities of globulin, which prevented formation of hard curd. The best treatment for pail-fed calves with indigestion and scouring was to feed them on warm water only for 24 hours and then on milk and water in equal parts for two days.—D. D. Ogilvie.

Wyssmann, E. (1946.) Über die Nekrose der Klauenbeinbeugesehne beim Rind. [**Necrosis of the deep flexor tendons of the bovine hoof.**]—*Schweiz. Arch. Tierheilk.* **88.** 597–603. **2033**

Necrosis of the bovine deep flexor tendon is not very often seen and its treatment is not easy. In 31 years W. encountered the condition 50 times, or in 1·5% of the bovine hoof conditions he treated. More than half the cases occurred in the autumn, and in 88% the hind hoof and in nearly all cases the lateral pedal bone were affected.

Usually the condition was due to neglected or unsuccessfully treated inflammations of the wall or the sole, but impacted nails or malignant abscesses after foot and mouth disease were also causes.

Prognosis was more favourable with younger animals. Although general opinion favours quick surgical operation W. had success with conservative treatment in 30 out of 39 cases.—C. Aharoni.

Cameron, H. S. (1945.) **Sheep diseases.**—*Circ. Calif. agric. Exp. Sta.* No. 130. pp. 36. **2034**

This is a review article written for the laymen, but its scope goes far beyond that of the non-veterinarian. It provides a useful synopsis of accepted views on the more common sheep diseases but contains several unorthodox statements, such as: "lamb dysentery is due to a variety of organisms", and "toxins produced by

anaerobes of the *Clostridium welchii* type should not be considered as a factor in production of pulpy kidney disease ".—G. B. S. HEATH.

I. BERTHELON, DRIEUX, H., & PALLAS, P. (1944.) La bouhite expérimentale. [**Research on *bouhite*, a malignant pulmonary lymphomatosis of Gascony sheep.**]—*Bull. Acad. vét. Fr.* **17.** 144–146. **2035**

II. LUCAM. (1944.) Recherches sur une maladie du mouton, vulgairement appelée " bouhite ". [**Research on a disease in sheep commonly known as *bouhite*.**]—*Ibid.* 240–243. **2036**

I. An endeavour to reproduce symptoms of *bouhite* by administering 0·25 g. essence of terebinth daily and gradually increasing the dose to 1·25 g. is described. A five-year-old ewe and her daughter 14 months old were used, administration continuing from February 14th to June 15th. The ewe was unaffected but the lamb had rapid breathing (62 per min.) which continued after administration was stopped. The lamb was killed on July 10th, and sero-lymphatic infiltration of the lung parenchyma was seen, but no nodules or other symptoms.

II. *Bouhite* affects sheep habitually grazed in pine forest and is thought to be due to an excessive and continuous intake of terebinth, possibly from eating pine needles, but more probably drinking water contaminated by them. Only young sheep up to 18 months are affected, but among them the death rate may be 100%. Symptoms include increased rate of breathing, wasting, infiltration of the parenchyma of the lung with serolymphatic fluid with numerous lymphocytes, hypertrophy of the bronchial and mediastinal nodes and, in advanced cases, nodules in the lung tissue. These nodules can be divided into a central necrotic zone, a giant cell zone, an epitheliod zone and a lymphoid zone. They can be distinguished from those of TB. by the absence of acid-fast micro-organisms. Removal from the pine area does not result in the recovery of sheep with symptoms of the disease.—R. MACGREGOR.

MARTY, J. (1944.) Contribution à l'étude de la " bouhite ". [*Bouhite* **(a malignant pulmonary lymphomatosis of sheep).**]—*Rev. Méd. vét., Lyon et Toulouse.* **95.** 25–29. **2037**

M. puts forward the hypothesis, based on clinical observation, that the syndrome *bouhite* is caused by a deficiency of calcium. [For other views on the aetiology of the condition see *V. B.* **17.** 132 & 235.]—W. M. HENDERSON.

I. DOBBERSTEIN, J., & MATTHIAS, D. (1943.) Schilddrüsenveränderungen beim sogenannten Herztod der Schweine. [**Lesions of the thyroid gland in heart apoplexy in pigs.**]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* August 6th. 251–253. **2038**

II. MAAS, A. (1944.) Weitere Untersuchungen über die Ursache des sogenannten Herztodes der Schweine. [**Further experiments on the cause of sudden fatal syncope of swine.**]—*Arch. wiss. prakt. Tierheilk.* **78.** 484–522. **2039**

I. Severe pathological changes in the thyroid were found in cases of heart apoplexy in pigs. Histologically the lesions were similar to those found in thyrotoxicosis. They may be the cause of the pathological changes in the heart, which lead to fatal syncope. This disease in pigs may therefore be called thyrotoxicosis.

II. During 1939–43, the incidences of fatal syncope and erysipelas were nearly parallel, with a peak in the months May, June and July. The fatal syncope was observed only in certain parts of the country and often in farms near to each other. The disease was accompanied by forced movements, perhaps due to lesions in the central nervous system. In some animals there were haemorrhagic inflammation of the small intestine, an acute dystrophy of the liver and serous effusions into the abdominal cavity. The pathological findings in the thyroid described by DOBBERSTEIN & MATTHIAS [see I] were found also in animals with other diseases such as erysipelas, pneumonia, nephritis, hepatitis and bone fractures. In six apparently healthy animals from farms where fatal syncope had occurred severe lesions of the heart muscle were found, but the thyroids were normal.

Further experiments were made to see whether sudden fatal syncope of swine could be transferred by contact to other animals. Out of 112 animals kept on nine farms where fatal syncope was observed, 38 died from the disease 20–30 days after contact with diseased animals. Feeding or parenteral administration of organs of swine which succumbed to the disease did not affect the experimental animals.—E. KODICEK.

PIRES, R. E. (1943.) Necrose aguda do pãncreas em cão. [**Acute necrosis of the pancreas in a dog.**]—*Rev. Fac. Med. vet. S. Paulo.* **2.** 203–210. [English summary.] **2040**

After a short period of lassitude and loss of appetite, the dog described developed slight convulsions and died suddenly. Examination P.M. revealed a duodenal ulcer and necrotic areas in the adjacent pancreas; some of the areas had undergone fatty degeneration. The inter-glandular tissue had extensive haemorrhagic infiltration and small spots of necrosis occurred in the mesentery. P. believes that death was due to acute pancreatitis, resulting in the discharge of trypanogen into the circulation. Such deaths are

common in the human being. Localized fatty degeneration of areas of the pancreas is common in fat stock and does not as a rule cause death or even loss of condition: this is believed to be the first case of the acute, fatal condition recorded in an animal.—R. MACGREGOR.

RISER, W. H. (1946.) **Posterior paralysis associated with intervertebral disc protrusion in the dog.**—*N. Amer. Vet.* **27.** 633–642. **2041**

Posterior paralysis in such long-backed breeds of dogs as dachshunds and Pekinese is discussed and the literature briefly reviewed. R. is of the opinion that many cases are due to protrusion of one or more intervertebral discs into the spinal foramen. The incidence of the condition increases with age and is higher in males than in females. Rupture of the fibrous portion of the disc with consequent protrusion of the pulpy central portion may occur suddenly from trauma or muscular stress resulting from falls, jumping over gates and sexual activity. Roach-backed dogs are probably predisposed to the condition. The article is illustrated by diagramatic drawings and many photographs. The possibility of surgical interference in treatment is suggested.
—M. C.

BLOOD, D. C. (1946.) **Cerebellar hypoplasia and degeneration in the kitten.**—*Aust. vet. J.* **22.** 120–121. **2042**

Two cases of cerebellar hypoplasia in kittens are described. Clinically the condition was characterized by nodding and waving of the head from side to side and swaying of the body. Incoordination was marked and limb movements were uncontrolled. Nystagmus was not observed. The eye reflexes were normal.

At autopsy, the cerebellum was smaller than normal. Histologically the cerebellum had hypoplasia and some signs of degeneration.—J. D. S.

HART, L. (1946.) **Diseases of the respiratory tract in fowls.**—*Aust. vet. J.* **22.** 125–130. Discussion pp. 130–131. **2043**

Diseases affecting the respiratory system of fowls in Australia and other countries are discussed, including fowl pox, vitamin A deficiency and infectious laryngo-tracheitis.

Two diseases recognized in recent years in Australia are described. These are:– (1) A disease of both chickens and fowls immunologically distinct from infectious laryngo-tracheitis and with a filter-passing aetiological agent. Clinically there is mucoid tracheitis, nasal discharges, panophthalmia and sinusitis. Twelve outbreaks were recorded by H. in the previous five years. (2) A disease characterized by mucoid tracheitis, nasal discharge and sinusitis, with coccobacilliform bodies seen in tracheal smears. Two infective agents with different filter passing qualities are suspected, but infective filtrate has not been successfully cultured. To these two diseases are ascribed some of the outbreaks of respiratory diseases observed in fowls vaccinated for infectious laryngo-tracheitis.

In the discussion, field experiences were mentioned and differential diagnosis and vaccination problems were discussed in some detail.
—D. A. TITCHEN.

FISCHEL, W. G. (1946.) **Enzootic fatal syncope (toxic heart degeneration) in fowls.**—*Aust. vet. J.* **22.** 144–149. **2044**

A highly fatal disease of fowls is described, 38 outbreaks having been encountered over a wide area in New Zealand in five and a half years, with an average mortality rate of about 25%. The heart is the main organ affected; it is seen to be enlarged with blunt apex, and the myocardium is pale, greyish-pink and parboiled in appearance. Other changes secondary to the heart degeneration are present. Impaction of the crop and/or gizzard is regularly observed.

Microscopically the heart muscle shows loss of cross-striation, granular degeneration and cloudy swelling and there is nuclear degeneration. The aetiology is undetermined and attempts at transmission have failed. Identical degenerative heart changes have been observed in pigs and sheep in which sudden deaths have occurred but there has been no connexion between these and the incidence in fowls.

Attention is drawn to a similar condition in pigs occurring in North Germany.—L. HART.

CHAMORRO, A. (1945.) Arthrite apparue chez le rat après surrénalectomie. [**Arthritis in the rat following adrenalectomy.**]—*C. R. Soc. Biol. Paris.* **139.** 589–591. **2045**

Adrenalectomized rats died 3–24 days after the operation. Those that survived long enough developed an arthritis of one or both tibial-tarsal joints, usually at the 12th–19th day, but in two cases on the third and fifth day. The arthritis took the form of a synovial and peri-articular inflammation. Four rats kept at a temperature of 13°C. did not develop arthritis.—R. MACGREGOR.

See also absts. **2127** and **2128** (myoglobinuria in horses), **2129** ("grease" in horses), **2130** (bovine stomatitis).

NUTRITIONAL AND METABOLIC DISORDERS

CANNON, C. Y. (1945.) **The nutrition of the bull.**—*Iowa Vet.* **16.** No. 5. 11–16 & 26. **2046**

The article discusses the nutritional requirements of the bull with special reference to existing

conditions in Iowa. Reference is made to vitamin C deficiency in the Great Lakes district which is stated to cause gum and dental pad lesions and to vitamin C therapy in sterility. Seasonal variation in semen production is briefly discussed. Sperm concentration and total ejaculation are given as maximum during April, May and June.—A. H. H.

I. Burroughs, W., Gerlaugh, P., Silver, E. A., & Schalk, A. F. (1946.) **Methods for identifying feeds and measuring their rate of passage through the rumen of cattle.**—*J. Anim. Sci.* **5.** 272–278. **2047**

II. Burroughs, W., Gerlaugh, P., Silver, E. A., & Schalk, A. F. (1946.) **The amounts of feeds and nutrients in the rumen of cattle throughout a 24-hour period as affected by plane of feeding and character of ration.**—*Ibid.* 338–349. **2048**

I. Since the utilization of the "woody" parts of corn cobs and similar roughage probably centres in the rumen, the length of time a feed remains in the rumen influences its utilization. Two methods of identifying feeds within the rumen are described, (1) a mathematical equating of nutrients occurring in the food with those found in the ingesta, by the use of simultaneous equation evaluating protein, nitrogen-free extract and crude fibre, and (b) the physical separation of identifiable contents of the rumen. The rate of passage of individual feeds was computed from differences in the determined amount of each feed in the rumen every four hours for a 24-hour period.

II. Three rations comparing shelled maize, ground shelled and ground ear maize were fed to fattening steers at three planes of nutrition. Rumen contents were examined at four-hour intervals for information on rumen physiology. The amounts of feeds in the rumen throughout the day were estimated by methods described in I. The significance of any differences noted was not capable of precise evaluation.—S. B. Kendall.

Tui, C. (1945.) **The value of protein and its chemical components (amino acids) in surgical repair.**—*Bull. N.Y. Acad. Med.* **21.** 631–655. [Author's summary copied *verbatim*.] **2049**

Proteins are essential to wound healing, to the maintenance of tissue integrity, and from present indications, to expeditious convalescence. Protein deficiency endangers all three.

A patient can become protein-deficient as a result of inadequate intake and increased nitrogen output or a combination of these two factors. Decreased intake may be due to the patient or neglect on the part of the attending staff. Increased output may be due to increased metabolic loss and to the loss through exudates. The ceiling of nitrogen intake in natural food is naturally low and consequently natural food is often inadequate to replenish the increased protein loss in disease and injury.

Studies of cases of burns, of postoperative gastrectomy, cholecystectomy and herniotomy, suggests that convalescence can be shortened, strength and weight conserved by full caloric and nitrogen replacement immediately postoperatively, and that there may be a critical range of nitrogen intake for each disease category.

The protein hydrolysates, by raising the ceiling level of nitrogen-intake, are indispensable in many disease conditions and can be used with greater elasticity than natural food. In the course of study on the value of protein hydrolysates, a new treatment for peptic ulcers has been evolved. Protein hydrolysates for clinical use must fulfil a number of criteria and clinicians using them must be quantitatively-minded.

A discussion on the assay of the nutritional course of convalescent patients has been attempted.

Jamieson, S., & Russell, F. C. (1946.) **Suspected copper deficiency in cattle in Aberdeenshire. [Correspondence.]**—*Nature, Lond.* **157.** 22. **2050**

A condition resembling the scouring disease of cattle and sheep which occurs on reclaimed swamps and peaty soils in New Zealand has been observed in three young cattle on an Aberdeenshire farm. In New Zealand it was found that the copper content of the pasture on which the disease occurred was less than half the normal level of 10 p.p.m. of dry matter. The amount of copper in the blood and liver of the affected animals was low. In Aberdeenshire, pasture on land reclaimed from heather contained only 2·5 p.p.m. of Cu, but had no other abnormality. Two of the affected animals improved somewhat after administration of Cu; the third, which died before treatment, had a Hb content of 7·9 g. per 100 ml. and a red cell count of 7·5 million per cu.mm. The disease was not associated with parasitic infestation.—E. M. Cruickshank.

Knoop, C. E. (1946.) **The effect of feeding potassium iodide and skim milk powder on spermatogenesis.**—*J. Dairy Sci.* **29.** 555. [Only abst. given: copied *verbatim*.] **2051**

The effects on spermatogenesis with certain problem bulls in artificial breeding work were noted when a normal ration of legume or mixed hay and a regular concentrate mixture was supplemented by one of the following: A high protein feed containing kelp and fishmeal, iron and copper salts, iodinated-casein, shark liver oil, potassium iodide, skim milk powder, or a combination of potassium iodide and skim milk powder. Marked

improvement in semen quality was observed in 7 of the 11 problem sires who daily received 50 mg. potassium iodide plus 0·8 pound skim milk powder for a period of 2 to 6 months. Improved spermatogenesis was indicated by one or all of the following factors: libido, quantity of semen, output of sperm cells, percentage of living sperm cells, and the motility-activity rating of the cells.

BRAUDE, R., KON, S. K., & THOMPSON, S. Y. (1946.) **A note on certain vitamins of sow's colostrum.**—*J. Dairy Res.* **14.** 414–418. **2052**

Samples of colostrum from 18 lactations by 11 sows were examined, the samples being collected within one hour of farrowing. The mean values for total solids and fat were 23·9 and 3·4% respectively; for vitamin A, 247 I.U. per 100 ml. or 89 I.U. per g. of fat. No β-carotene was detected in any of the samples. The mean values for vitamin B_1 and riboflavin were respectively 145 μg. and 45·6 μg. per 100 ml. and for ascorbic acid in the reduced form, 23·8 mg. per 100 ml. Dehydro-ascorbic acid was absent. The range of values for the various constituents was wide. The riboflavin concentrations observed were much lower than those which have been recorded for cows' colostrum, but no improvement in growth was obtained by supplementing the exclusive milk diet of piglets with riboflavin. A note adds that the exceptionally high vitamin C content, which was about ten times that found in cows' colostrum, has been confirmed by subsequent work.

—E. M. CRUICKSHANK.

HANSEN, R. G., PHILLIPS, P. H., & RUPEL, I. W. (1946.) **The effect of vitamin supplements upon survival of new-born calves.**—*J. Dairy Sci.* **29.** 761–766. **2053**

Since the bovine placenta is relatively impervious to the passage of vitamin A a calf may easily be deficient in this factor. The deficiency is normally made good by ingestion of colostrum.

Holstein calves were used in an experiment to determine the amount of vitamin A required to supplement the diet of a calf fed from birth on skim milk plus 250 mg. per day of ascorbic acid. The influence of other factors occurring in colustrum was investigated. In preliminary experiments with a skim milk diet, highest mortality occurred in the first week of the calves' life, when vitamin A needs were high. It appeared that 10,000–25,000 I.U. of vitamin A per day as fish-liver oil concentrates assisted survival. In the presence of adequate vitamin A, nicotinic acid and biotin had no favourable supplementary effect.

A seasonal survival effect was seen during the course of the experiments. During the period January 1st to June 1st, 86% of the calves had symptoms of severe diarrhoea during the first week of life. In contrast, in the period from June 1st to January 1st only 43% of the calves developed severe diarrhoea. [It is noted that varying percentages of the experimental calves were treated with sulphathiazole to control scouring, and that in one experimental group the number used was three only.]—S. BRIAN KENDALL.

DEANE, H. W., & MCKIBBIN, J. M. (1946.) **The chemical cytology of the rat's adrenal cortex in pantothenic acid deficiency.**—*Endocrinology.* **38.** 385–400. **2054**

Male rats which had been weaned and placed on a purified diet deficient in pantothenic acid grew poorly and had symptoms attributable to this deficiency (diarrhoea, porphyrin deposits in hair and mottling due to haemorrhage in the adrenals, thymus and kidneys). The adrenal cortex became enlarged and the zonae reticularis and fasciculata were progressively drained of ketosteroids and gave cytological evidence of exhaustion. By the end of six weeks the zona fasciculata was entirely depleted of its hormone. The severely deficient animal had a decrease in liver glycogen as well as shrunken and often dying liver cells, the kidney tubule cells near the medulla had signs of degeneration and the thymus was atrophied. It is suggested that pantothenic acid deficiency acts as an "alarming" agent and thus causes the release of pituitary adenotropin; this stimulates the adrenal to enlarge and increase its secretion of corticosterone. The effect is so severe that the adrenal becomes exhausted of corticosterone.—J. M. ROBSON.

LINDLEY, D. C., & CUNHA, T. J. (1946.) **Nutritional significance of inositol and biotin for the pig.**—*J. Nutrit.* **32.** 47–59. **2055**

The experiments were undertaken to determine whether the pig needs inositol and biotin in the ration or whether enough of these two vitamins is obtained by synthesis from its intestinal flora.

During a five-week trial on 12 pigs which were six weeks old, the addition of either inositol or biotin to a basal ration had no beneficial effect on growth or efficiency of feed utilization. The basal ration consisted of casein, sucrose, lard, mineral mixture, vitamins A, D, E and K, thiamine, riboflavin, nicotinic acid, pantothenic acid, pyridoxine and choline chloride. The addition of sulphaguanidine had no appreciable effect on the inositol and biotin requirements of the pig.

Sulphathalidine when added to the basal ration produced in the pigs deficiency symptoms consisting in spasticity of hind legs, loss of hair, dermatosis of the skin characterized by dryness, roughness and a brownish exudate, cracks in the feet and exudate around the eyes. The syndrome

was similar to that produced in pigs fed desiccated egg white and could be prevented by the addition of biotin to the basal diet.

Inositol could replace biotin and alleviated to a large extent the deficiency symptoms. It is suggested that inositol acted indirectly by stimulating the intestinal synthesis of biotin.

The efficiency of feed utilization was impaired when sulphathalidine was fed, smaller gains being obtained when the same amount of feed was eaten by the pigs. The authors conclude that biotin and inositol are concerned with the efficiency of utilization of the food.—E. KODICEK.

SCOTT, M. L., NORRIS, L. C., CHARKEY, L. W., DANIEL, L. J., & HEUSER, G. F. (1946.) **Further studies of organic factors required for prevention of anemia in chicks.**—*J. biol. Chem.* **164.** 403–410. **2056**

A study was made on chicks to determine whether pyracin is required for the prevention of anaemia in the presence of free folic acid and whether factor S from dried brewer's yeast contains an anti-anaemic factor not identical with folic acid.

Pyracin was found not to be required when the diet contained free folic acid. Since the addition of β-pyracin to a diet containing certain folic acid conjugates is necessary to prevent the occurrence of anaemia in chicks, it is concluded that β-pyracin functions in an enzyme system concerned in the breakdown of conjugated folic acid and the liberation of free folic acid.

Factor S was found to possess anti-anaemic activity. Its addition to a diet containing adequate amounts of folic acid and β-pyracin, significantly increased the haemoglobin level in chicks.—E. K.

STOKES, J. L., & LARSEN, A. (1945.) **Transformation of the *Streptococcus lactis* R factor to "folic acid" by resting cell suspensions of enterococci.**—*J. Bact.* **50.** 219–227. **2057**

The authors investigated the conversion of the *Str. lactis* [S.L.] R factor to folic acid (*L. casei* activity) by resting cell suspensions of enterococci. They studied the efficiency of different strains, the effect of the growth medium, pH, age and concentration of cells, addition of carbohydrates and other environmental factors and the place of conversion of the S.L.R. factor to folic acid.

Five different strains were tried (*S. lactis* R., *S. faecalis* F24, *S. zymogenes* 5CL, *S. faecalis* 732, and *S. durans* 98A), their relative conversion efficiencies varying considerably, the first three converting 6–7 times more than the other two strains. *S. lactis* R cells grown in media containing the S.L.R. factor were more active than those grown with folic acid or thymine. The amount of folic acid produced was also related to cell concentration. Suspensions containing the equivalent of 1·6 mg., 4·8 mg., and 6·4 mg. of dry cells per ml. gave folic acid values of 4,700, 7,600, 9,500 and 12,800 mμ respectively. Increasing the concentration of the S.L.R. factor caused a corresponding increase in folic acid. The transformation was rapid; maximum folic acid values were obtained within two hours. Cells from cultures nearing the end of the log phase formed more folic acid than younger cells. In the range of pH studied, between 5–8, pH 8 was optimum. The activity was destroyed completely on heating the cells, suspended in phosphate buffer, at 60°C. for 30 min. A study of 13 carbohydrates revealed that glucose, fructose and *d*-ribose increased the formation of folic acid 4–20 fold. The three carbohydrates were the only ones fermented by the resting cells, as indicated by methylene-blue reduction tests. The yields of folic acid were not significantly increased by raising the amount of glucose in the conversion mixture from 8 mg. to 162 mg.

Practically all the formed folic acid was found within the bacterial cells. It could be extracted quantitatively when the folic acid was autoclaved in the folic assay medium, but not by autoclaving with water where 87% of the folic acid was destroyed. Addition of 0·5% sodium thioglycollate or 3·0% ascorbic acid fully protected the growth factor. Digestion of the cells with clarase also was effective without loss of activity.—E. K.

CLANDININ, D. R. (1946.) **The significance of the level of riboflavin in the ration of breeding birds.**—*Poult. Sci.* **25.** 223–231. **2058**

A study has been made of the effect of the level of riboflavin in the hen's diet on the riboflavin content of fresh eggs, incubated eggs and livers of day-old chicks, and on the growth, incidence of curled-toe paralysis and riboflavin content of the livers of chicks fed rations containing varying amounts of riboflavin.

The riboflavin content of fresh eggs varied according to the amount of riboflavin supplied by the diet of the hens: there was 2·0 μg. riboflavin per g. of egg, from hens on a low riboflavin ration and 2·65 μg. riboflavin per g. of egg when a high riboflavin diet was fed. The riboflavin content of eggs did not change during an incubation of seven, 14 or 19 days, respectively. This indicates that the embryo is unable to synthesize riboflavin. The riboflavin content of livers was low for day-old chicks from breeders fed a low-riboflavin ration, 16·48 μg. per g., while 21·71 μg. of riboflavin was found in livers of chicks from breeders fed a high riboflavin diet.

The level of riboflavin in chicks at hatching time influenced their growth and the incidence of

curled-toe paralysis when they were fed diets low, or even adequate in riboflavin. The riboflavin content of livers of chicks five, ten, 14 and 28 days old was closely correlated with their growth and the incidence of curled-toe paralysis and was also dependent on the amount of riboflavin in the livers at hatching and thus dependent on the diet of the breeding animals.

The author concludes that the riboflavin content of the diet of breeders exerts its main influence on the chicks in the first two weeks of life, while the amount of riboflavin in the diet of the chicks has an important effect on their rate of growth during the third and fourth week after hatching.—E. KODICEK.

FABRICANT, J. (1946.) **Overeating disease (enterotoxemia) of sheep.**—*Thesis, Cornell.* pp. 69. **2059**

This is a complete review of the literature on the subject.—H. L. GILMAN.

See also absts. **2030** (low nutrition a cause of wastage in cattle), **2069** (ketones in blood of cattle), **2171** (in sheep), **2175** (vitamin deficiencies).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

BRODY, S. (1946.) **Growth and aging problems in agriculture.**—*Science.* **104.** 307–312. **2060**

The problem of agriculture is to develop rapidly and efficiently growing animals which can transmit their desirable qualities to their progeny. At present this can only be done by progeny tests which are slow and laborious and there is great need for standards of growth and aging which would be generally applicable, whereby animals possessing desirable qualities could be recognized whilst still young. Aging is important because by the time progeny tests have been carried out, in many cases, the original parents are no longer available. Artificial insemination has overcome some of the difficulties and the study of hormones may lead to further advances; for example, it has been shown that thyroxin or thyro-active protein when fed to five-year-old hens increases their egg production by 30%; it also improves the fertility of old rams.

The earlier an animal matures the earlier it dies and since the proportion of young tissues in the body declines with age it follows that growth and aging are closely associated. The formation of new tissue is largely controlled by hormones so that the hormonal balance may very well influence growth and aging. In addition, environmental temperature is of great importance, since high temperatures lead to a depression of production levels and in the long run to reduction of body size. In countries with hot climates, therefore, ways and means of increasing the resistance of animals to temperature are urgently required.

—J. A. NICHOLSON.

TEMPERTON, H., & DUDLEY, F. J. (1945.) **The intensity of yellow pigmentation as a guide to health and future productivity in White Leghorn pullets.**—*Harper Adams Util. Poult. J.* **30.** 22–27. **2061**

It has been a common belief of poultrymen that an intense yellow pigmentation in growing poultry is a criterion of constitutional vigour. Depth of eye pigmentation has been used as an index for controlling lymphomatosis, but is not reliable. In this paper a review is given of present knowledge of some aspects of yellow pigmentation in fowls.

An experiment was devised to find whether there is any correlation between the intensity of pigmentation of yellow skinned breeds, and constitutional vigour and future productivity. White Leghorns were classed at 18 weeks of age into groups according to pigmentation intensity in the beak, rim of eye and skin, pigmentation intensity in the iris and the shape and reflex powers of the pupil. There was little correlation initially between body pigment and eye colour or between body pigment and condition of pupil, but there was a stronger relation between eye colour and condition of the pupil. The results of the experiment revealed that the extent of pigmentation in the body, the colour of eye and the condition of pupil were no guide to health in birds, and that egg production and body weight did not differ markedly in the three groups.—S. B. KENDALL.

BRITO-BABAPULLE, L. A. P. (1946.) **Various factors that affect milk composition.**—*Indian vet. J.* **22.** 414–425. **2062**

A number of the factors affecting the quality and quantity of milk are discussed. Apart from such common factors as breed, individuality, period of lactation, interval between milkings, feed, age, etc., other factors such as effect of music, hormones and drugs, spaying, abortion, sexual excitement, etc., have been detailed.—S. GUHA.

ROMIJN, C. (1946.) De haemoglobinen der equiden en enkele andere zoogdieren. **[Haemoglobin in equines and some other mammals.]** —*Tijdschr. Diergeneesk.* **71.** 650–654. [Abst. from English summary.] **2063**

The alkali denaturation of the haemoglobin of Equidae and other mammals was examined spectrophotometrically. In true horses it was similar, but in the zebra and Norwegian horse (which in some respects resembles Przewalsky's horse), haemoglobin had greater alkali sensitivity:

that of donkeys and mules was more alkali-resistant. Of other mammals studied, human beings, apes and carnivores were found to have highly alkali-sensitive haemoglobin. The haemoglobin of the cow, yak, goat and zebu was very resistant.

RACE, R. R. (1946.) **A summary of present knowledge of human blood-groups, with special reference to serological incompatibility as a cause of congenital disease.**—*Brit. med. Bull.* **4.** 188–193. **2064**

Knowledge of haemolytic disease of the new born as a result of incompatibility between the maternal and foetal blood is briefly reviewed. Much has been learned of the inheritance of blood-group antigens in man, but little is known of the inheritance of blood-group antibodies. The reciprocal arrangement of antigens and antibodies is found as a rule only with the A B O groups. The antibodies of the other blood group antigens seldom occur naturally and anti-Rh has not been found to occur naturally.

Very few cases of haemolytic disease due to incompatibility of the A B O group have occurred although iso-immunization to these antigens does occur in pregnancy. Several reasons have been advanced to account for this, *viz*, lack of placental permeability to anti-A and anti-B, lack of sensitivity of the foetal erythrocytes, neutralization of these antibodies in foetal plasma and diminished activity of anti-A and anti-B at body temperature.

In the great majority of cases of haemolytic disease in the new born child it is the Rh antigen D which is concerned. Cases occur in which the mother is Rh-negative and the father is either homozygous or heterozygous for antigen D. The first child or the first two children in such a family are nearly always unaffected, presumably because the anti-D titre of the maternal blood has not yet reached a sufficiently high level. When a first child is affected the mother usually has a history of a past blood transfusion.

There is as yet no evidence that blood group incompatibility may be a cause of toxaemia of pregnancy in women.—M. C.

BINET, L., & STRUMZA, M. V. (1945.) Détermination de la masse sanguine chez le chien normal et chez le chien hémorragié. **[The blood volume of the dog.]**—*C. R. Soc. Biol. Paris.* **139.** 570–571. **2065**

The blood volume of the dog was determined as follows. Under chloral anaesthesia the femoral artery of the dog was opened and after withdrawal of over 50% of the blood, the artery was ligatured and a known weight of plasma or serum rapidly injected by the saphenous vein, accompanied if necessary by artificial respiration and heart massage. Determinations of the haemoglobin levels, initially (Hb_0) and after injection (Hb_1) enables the initial blood mass (M) present to be calculated from the equation

$$M = \frac{S\,Hb_0 + (I-S)Hb,}{Hb_0 - Hb_1}$$

where S mass of blood removed by bleeding and I mass of serum or plasma injected.

The use of artificial sera for injection employing saline or glucose solutions led to erroneously high values for the blood volume, because of the rapidity with which such artificial sera leave the circulatory system. With 28 dogs, the blood volume represented a mass of $9{\cdot}2 \pm 0{\cdot}59\%$ of the weight of the animal. Other experiments with 30 dogs suggested that it was impossible to "bleed out" more than about 60% of the total blood volume under conditions of chloral anaesthesia.—A. EDEN.

SMITH, E. M. (1946.) **Blood cell counts and hemoglobin value in normal and diabetic dogs.**—*Amer. J. clin. Path.* **16.** 457–461. **2066**

Estimations were made on the blood of ten dogs (seven male, three female) in which diabetes had been surgically induced, controls consisting of six normal dogs (three male, three female). S. found that in the diabetic dogs the average values for erythrocyte count and haemoglobin were lower and the average value for leukocyte count was higher than in the control dogs. Only total leucocyte counts are recorded and the technical methods used are not described in any detail.

—LIONEL M. MARKSON.

MARSHALL, A. H. E. (1946.) **Observations on the pulmonary macrophage system.**—*J. Path. Bact.* **58.** 729–738. [Author's summary copied *verbatim*.] **2067**

The use of the silver carbonate and ammoniacal silver techniques demonstrates two types of argyrophil cells in the lungs of man, the rabbit and the cat. These cells bear a close resemblance to the microglia of the brain and to the cells of the reticulo-endothelial system elsewhere in the body, both of which are demonstrated by the same methods. These cells store vital dyes and react in pathological processes to form the alveolar phagocytes. They are considered to be of mesenchymal nature and members of the reticulo-endothelial system. The possible part played by other types of cell in the defence of the lung is discussed.

ELSDEN, S. R. (1945.) **The fermentation of carbohydrates in the rumen of the sheep.**—*J. exp. Biol.* **22.** 51–62. **2068**

From analyses of ruminal contents of sheep, the chief volatile fatty acids found present were

acetic, propionic and butyric acids, 55–75% of the total being acetic acid. In experiments *in vivo* cellulose, glucose and lactic acid were rapidly fermented, yielding acetic and propionic acids. Lactic acid arises as an intermediate stage in the fermentation of glucose, and butyric acid arises from glucose and lactic acid.

A study of the organisms present revealed that three groups are mainly responsible for fermentation. These are an untyped iodophile coccus which ferments glucose and starch; a yeast-like organism, *Schizosaccharomyces ovis*, probably responsible for the rapid fermentation of soluble sugars, and members of the genus *Propionibacterium* which possess the ability of converting lactic acid to propionic and acetic acids.

Further evidence was obtained to show that diet influences the ruminal flora. Thus on a diet of poor quality hay, glucose was not fermented. On improving the diet the rate of glucose disappearance from the rumen and the increase in lactic and volatile fatty acids became normal. —J. A. NICHOLSON.

PINCUS, I. J., FRIEDMAN, M. H. F., THOMAS, J. E., & REHFUSS, M. E. (1944.) **A quantitative study of the inhibitory effect of acid in the intestine on gastric secretion.**—*Amer. J. digest. Dis.* **11.** 205–208. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 2. 6, slightly amended. Signed: E. HYDE.] **2069**

Using three dogs with Pavlov pouches and one dog with a Heidenhain pouch, each with gastric and duodenal cannulas, the effect of the introduction ot HCl into the intestine, at the bulb or approximately 15 cm. below, on the free and total acidity of gastric contents was studied during fasting, after an oral test meal after administration of insulin, after placing ground beef in the stomachs and after histamine injection. At intervals, pH determinations of the intestinal contents were made electrometrically. Marked inhibition of gastric secretion in response to a meal was noted if the pH of the intestinal contents was about 2·5 and almost complete depression when the pH was 2·0 or lower. This was not observed in the cases of secretion provoked by histamine. A mechanism regulating gastric secretions and factors involved are discussed.

SEEKLES, L., & HAVINGA, E. (1943.) Bepaling der pH van maaginhoud met behulp van indicatorpapier. **[The determination of the pH of the gastric contents by means of indicator paper.]**—*Tijdschr. Diergeneesk.* **70.** No. 3. 88–94. [English, French and German summaries.] **2070**

The authors discuss the use of indicator papers as a means whereby the clinician can determine rapidly and fairly accurately the pH of gastric contents in cattle and horses. The investigation was undertaken when it became apparent that the pH of the contents of the rumen and abomasum may influence the fermentations in these organs and result in the absorption and occurrence in the circulation of certain chemical compounds, *e.g.*, acetone bodies.

The pH of 95 samples of stomach contents from man, cattle and horse was determined by the glass electrode method and "lyphan" indicator papers. The tests revealed that the "lyphan" indicator papers L.651 (pH 1·0–2·8), L.652 (pH 1·6–3·7), L. 656 (pH 2·6–4·1), L. 662 (pH 3·9–5·4), L. 665 (pH 5·2–6·7) and L. 669 (pH 6·6–8·1) and probably L. 671 (pH 7·5–8·7) gave results which were in satisfactory agreement with those of the glass electrode method and are recommended for use. With L. 620 (pH 1·0–3·1) and M.25 (pH 6·6–8·1) test papers, however, there were considerable differences.—P. L. LE ROUX.

SAMPSON, J., & BOLEY, L. E. (1945.) **Some observations on the total ketone bodies of the blood of apparently healthy dairy cattle.**—*Cornell Vet.* **35.** 314–320. **2071**

Observations made during the months of June to July and November to January on a large herd of apparently healthy dairy cattle which included several breeds of lactating and dry cows and non-pregnant heifers, showed that the mean values of total ketone bodies in the blood were significantly higher during the June-July period than during the November-January period. Values of 4·25 mg. per 100 ml. blood were obtained for 49 lactating cows in June-July compared with 0·74 mg. for 51 similar cows in November-January. For dry cows, the average for eight in June-July was 3·41 mg., compared with 0·53 mg. for 12 in November-January, while for heifers the average value for seven was 2·62 mg. for the summer period, compared with an average of 0·69 mg. for 15 for the winter period. A balanced dairy ration including corn silage was fed throughout the experiment.

There appeared to be very little, if any, relation between the breed of cattle and the ketone content of the blood. It is suggested that an inverse relationship exists between length of lactation and concentration of blood ketone bodies. —R. ALLCROFT.

MOORE, C. R. (1944.) **Gonad hormones and sex differentiation.**—*Amer. Nat.* **78.** 97–130. **2072**

This is a thoughtful review of the evidence on the problem whether sex hormones play a role in sexual differentiation. The term sex hormone is restricted to steroid substances secreted by the gonads and specifically excludes substances of

adrenal, pituitary and chromosome origin, as well as inductor substances. The application of androgens and oestrogens during development has induced many modifications, both of gonadal differentiation and of the differentiation of the sex ducts and other accessory sex characters. The effects produced vary in different species and in mammals no modifications of gonadal differentiation have been achieved. M. believes that the modifications produced in the gonads lack specificity, conforming with the character of the hormone, or predictable responses, and that quite similar effects may be produced by many other non-specific factors, *e.g.*, temperature changes, gonad and other grafts, non-androgenic or non-oestrogenic steroids; hence he believes that the effects produced by hormonic steroids may be entirely non-specific in nature. The responses of the duct system have also, in M.'s opinion, been variable and lacking in specificity, suggesting that normal differentiation is not controlled by these substances. The results obtained by administration of gonadotropins suggest that sex hormone secretion by the gonads begins much later in ontogeny than the characteristic disposition of the embryonic duct system: if this were true it would be necessary to exclude gonad hormones as agents in the regulation of sex differentiation. The finding that gonad removal during the anlagen stage of the reproductive system in the opossum is without effect on the differentiation of the sex ducts and glands up to a stage when differentiation is essentially complete shows that the intervention of gonadal secreted hormones to guide differentiation is not required. A satisfactory interpretation of the freemartin still has to be given; a humoral substance transmitted by the blood stream must be the effective agent, but it need not be a steroid and may originate in the cells of the soma tissues in general rather than in the testes specifically.—J. M. Robson.

*Mello, R. F., & Franke, C. (1944.) **The comparative duration of estrus induced by ovarian and urinary estrogens.**—*Rev. brasil. Biol.* **4.** 333–338. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 7. 11, slightly amended. Signed: J. L. Cartledge.] **2073**

Duration of oestrus was measured in 150 spayed rats after subcutaneous injections of equal amounts of eight ovarian and urinary oestrogens. Caprylate and dipropionate of oestradiol provoked the longest periods, averaging 31 and 11·4 days, from 50 μg.; the ovarian oestrogens provoked periods of 1·7–3·8 days, while the urinary oestrogens had very transient effects. This difference may be due to the more protracted absorption of the ovarian oestrogens, but the rate of absorption of oestrone is less than that of oestradiol, while its oestrogenic threshold concentration is higher.

Bogart, R., & Mayer, D. T. (1946.) **The relation of temperature and the thyroid to mammalian reproductive physiology.**—*Amer. J. Physiol.* **147.** 320–328. **2074**

High temperatures cause a marked lowering in the activity of the reproductive organs of rams. Thyroxin or thyro-active proteins (iodinated casein) given to rams during periods of high temperature at periods between the breeding season stimulates the reproductive organs and restores the reproductive activities to a level near that of the breeding season. Changes in semen similar to those resulting from high temperature are induced during the breeding season by administration of thiouracil, which depresses the thyroid function. Thyro-active materials counteract the detrimental effects of thiouracil upon reproduction. It is concluded that temperature does not influence reproductive physiology in the ram by its direct action on the testes, but by an effect on the thyroid function.—J. M. Robson.

Wolfe, H. R., Meyer, R. K., & McShan, W. H. (1945.) **The negative phase in the antigonadotrophic and precipitin-productive activities in rabbits.**—*J. Immunol.* **50.** 349–357. **2075**

When rabbits were immunized with sheep pituitary gonadotropic preparations containing both luteinizing and follicle stimulating fractions, it was found that after 4–8 months, the rabbit sera inhibited the ovarian response of 21-day-old rats to injection of the hormone preparations. Immunization was effected by the subcutaneous administration of 250 mg. of antigen thrice weekly.

In order to establish if this was a true immunological reaction, the negative phase in rabbits immunized with the gonadotropic preparations was studied. The results clearly showed that as with other antigens, the hormone preparations when injected into rabbits already having antigonadotropic substance in their sera produced a marked temporary decline in the antigonadotropic activity of the sera.

The rabbit sera also contained precipitins against sheep serum, but on testing sheep serum with the antigens, it was found that the negative phase in the serum precipitin, but not in the antigonadotropic substance, was produced. It is concluded that the antihormone is a true antibody, distinct from the precipitin, and that the hormone is not bound to the sheep serum proteins.—J. A. N.

White, J. B., & Foust, H. L. (1944.) **Growth changes in body organs. III. Growth changes in the pituitary of the normal dog.**—*Amer. J. vet. Res.* **5.** 173–178. [For parts I & II, see *V. B.* **12.** 51.] **2076**

This paper covers a systematic study of growth changes in the pituitary gland of the dog. The glands from 203 dogs (82 male and 121 female) were removed, weighed, stained and sectioned. A logarithmic straight line relationship between gland weight and body weight suggests the possibility that the equation $P = 0{\cdot}6965W + 1{\cdot}3122$ (P being the logarithm of the pituitary weight in mg. and W the logarithm of the body weight in kg.) be used for predicting the size of the gland at any given body weight.

Comparison with the weight of thyroid gland gave no obvious correlating feature, neither could any significant change be attributed to breed, sex or physiological state of the animal.

Preliminary studies of cell counts indicated a tendency for chromophobes to decrease and chromophiles to increase during the growing period.—C. W. OTTAWAY.

SEIFERLE, E. (1939.) Zur Rückenmarkstopographie von Pferd und Rind. [**Topography of the spinal cord in horses and cattle.**]—*Z. Anat.* **110.** 371–384. **2077**

This is a study of the position of the segments of the spinal cord relative to the bodies of the vertebrae and to the bases of the spinal processes. These do not all correspond in the transverse vertical plane. The exact relationship for the horse and the ox is shown in scale drawings.

The article includes a half-schematic illustration of the cutaneous distribution of the dorsal and ventral branches of the spinal nerves in the horse.—J. E.

See also absts. **1929** (B-complex vitamins, synthesis by tubercle bacilli), **2016–2021** (endocrines), **2022** (sexual cycle), **2047, 2048** (ruminant digestion), **2054** (cytology of adrenal cortex), **2144** (duration of pregnancy in cattle), **2145** (sex hormones in urine), **2159–2166** (technique), **2177** (mammalian reproduction).

POISONS AND POISONING

BOUCHET, A. (1945.) Intoxication arsenicale chez des vaches. [**Arsenical poisoning in cows.**]—*Bull. Acad. vét. Fr.* **18.** 332–335. **2078**

B. was called in to examine a cow which had died suddenly after being turned out with other cows into a field where another cow had died suddenly some weeks previously. P.M. examination revealed little apart from a slight congestion of the abomasum and a marked irritation of the small intestine. A tentative diagnosis of poisoning was made, although search of the field and thorough examination of the rumen contents revealed nothing that could be specifically incriminated.

Laboratory examination gave a negative bacteriological report, but chemical analysis revealed the presence of 6 p.p.m. arsenic in the rumen contents and 4 p.p.m. in the liver, from which a calculation indicated the possibility that a toxic dose of As had been ingested. The source of the poison could not be traced although circumstantial evidence was suggestive of a possible malicious intent.—A. EDEN.

DOLL, E. R., HULL, F. E., & INSKO, W. M., Jr. (1946.) **Toxicity of sodium chloride solution for baby chicks.**—*Vet. Med.* **41.** 361–363. **2079**

Serious mortality occurred in a flock of baby chicks which were receiving water containing 0·54% sodium chloride; mortality was highest during the first two weeks but increased again during the seventh and eighth weeks. An identical condition was reproduced experimentally in groups of chicks when they were given 0·5% and 0·9% solutions of sodium chloride as drinking water; concentrations of 0·25% were not toxic. —J. D. BLAXLAND.

ROSENFELD, I., & BEATH, O. A. (1945.) **The elimination and distribution of selenium in the tissues in experimental selenium poisoning.**—*J. Nutrit.* **30.** 443–449. **2080**

Urinary elimination and distribution of selenium were studied in groups of sheep on high, medium and low protein diets and which received graded doses of Se for 44 and 116 days. A control group was fed similar diets without added Se. The high and medium protein groups received a total of 860 mg. and the low protein group 360 mg. Se before toxic symptoms appeared. Continuation of Se until death resulted in decreased elimination with subsequent oliguria and anuria, due to kidney injury; 50 days after cessation of Se administration, all the urines contained only traces or were free of Se.

The storage of Se in the tissues depended on the amount of Se administered but in all groups the liver and kidney contained the largest and the brain and muscle the smallest amounts; the fat in all groups was free of Se. Only traces were present in tissues 61 and 64 days after Se was discontinued and it was considered that these small amounts were insufficient to cause harmful effects if the tissues were consumed by human beings.—R. ALLCROFT.

BLOUNT, W. P. (1945.) **A case of phosphorus burns in the dairy cow.**—*J. R. Army vet. Cps.* **17.** 21–23. **2081**

The lesions produced in a grazing dairy cow by the bursting of an aircraft phosphorus smoke container in its vicinity are described. The appearance of many small lesions gave the impression that the phosphorus had been sprayed on to the animal. The hair of the affected regions showed curling, singeing, or complete loss with

charring of the skin surface. When first seen the animal's coat was "glowing" and there was a distinct smell, as of burning matches.
—J. Lochiel McGirr.

Bakker, D. D. (1946.) Intoxicatie-verschijnselen bij enkele paarden, vermoedelijk tendevolge van lucerneklaver. [**Apparent poisoning in horses following the consumption of lucerne.**]—*Tijdschr. Diergeneesk.* **71.** 621–627. [Abst. from English summary.] **2082**

B. describes seven cases of apparent poisoning in horses which had for some months been pastured on lucerne. All proved fatal, after symptoms of stomatitis, anaemia, increased bilirubin in the blood, ataxia and paralysis. Liver degeneration was the chief lesion observed P.M. Since no other cause was found, the disease was attributed to the lucerne.

Linon, G., & Pons, P. (1943.) Empoisonnements de grands bovins par le sorgho à balai et le sorgho d'alep. [**Sorghum poisoning of cattle.**]—*Rev. Méd. vét., Lyon et Toulouse.* **94.** 206–208. **2083**

During July and August cases of poisoning resulting from the ingestion of sorghum were reported from the Toulouse region in France. Such poisoning is due to the presence of a cyanogenetic glucoside in the young and growing plant which is practically absent by the time the flowering stage is reached. The amount of the glucoside is considerably increased during times of drought, as occurred during the season in question, and precautions to avoid poisoning of stock depend largely on intelligent management and avoiding grazing sorghum when the plant is at its most dangerous stage of growth. The symptoms of poisoning by sorghum are well known and include nervous troubles, paresis, abdominal pains, colic, dyspnoea and sometimes even vomiting.—A. E.

Lall, H. K. (1946.) **A note on an outbreak of baru (Sorghum helipensis) poisoning.**—*Indian vet. J.* **22.** 439–442. **2084**

Eleven cattle grazing on wilted *baru* grass became ill, with symptoms of staggering gait, convulsions and grinding of teeth: two animals died. The sodium picrate paper test indicated the presence of HCN in *baru* grass and rumen contents. P.M. findings also simulated those of HCN poisoning. Ripe and semi-ripe *baru* grass fed to four calves caused no illness and the picrate test was negative. It is concluded that only wilted *baru* grass is poisonous.—R. Chanda.

Chowdhury, A. R. K. (1945.) **Haemorrhagic septicaemia or madar poisoning.**—*Indian vet. J.* **22.** 197–199. **2085**

One of two cases of criminal *madar* (*Calatropis giganta*) poisoning in bullocks, confirmed by chemical examination, is described. The poison is introduced at the throat region by a pointed instrument and as a result the animal dies with a local swelling often mistaken for haemorrhagic septicaemia. Differential signs from haemorrhagic septicaemia are absence of fever and the formation of a local swelling of an inflammatory character around the point of penetration, which does not pit on pressure.—V. R. Rajagopalan.

Randall, J. B., & Beveridge, C. G. L. (1946.) **A note on the toxicity of phenanthridinium 1553 for cattle.**—*Vet. Rec.* **58.** 398–399. **2086**

The work cited indicates that the toxic level of dosage of phenanthridinium 1553 is 1–2 mg. per kg., *i.e.*, considerably lower than that indicated by Bell [*V. B.* **16.** 122], that subcutaneous injection at this dose level leads to severe local reactions and that intramuscular injection of 1 mg. per kg. in 1% solution is the method of choice for field work. The local lesions produced by subcutaneous injection of 1–5 mg. per kg. and the generalized photosensitization which follows are described.—J. Lochiel McGirr.

Woods, W. W. (1946.) **The changes in the kidneys in carbon tetrachloride poisoning, and their resemblance to those in the "crush syndrome".**—*J. Path. Bact.* **58.** 767–773. [Author's summary copied *verbatim*.] **2087**

Three cases of carbon tetrachloride poisoning are described in adult men in whom death was attributable to severe changes in the kidneys. These changes resemble those characteristic of the "crush syndrome". It is suggested that the tubulo-venous communications present may be largely responsible for the clinical and histological features of this type of renal disease.

Kingscote, A. A., Henderson, J. A., & McIntosh, R. A. (1946.) **Observations upon the effect of spraying cattle with excessive quantities of DDT and black disinfectant.**—*Canad. J. comp. Med.* **10.** 322–324. [French summary.] **2088**

The materials used were 60% wettable D.D.T. and a black disinfectant derived from coal tar, with a phenol co-efficient of 5. The spray mixtures were prepared by adding in proportion 4 lb. D.D.T. and/or 1 gal. disinfectant to 100 gal. water. These were kept mixed by mechanical action. The spray was applied to grade cattle over a period of 15 days. Each animal was kept in a room of 540–1,170 cu. ft. and was exposed to 7–9 gal. of spray.

No toxic effects were observed. The amount of spray used was considerably in excess of that which is likely to be used under field conditions.
—P. J. G. Plummer.

See also absts. **2035**, **2036** (*bouhite* in sheep due to poisoning by terebinth from pine trees), **2090** (dicoumarin), **2138** (rodent poisons), **2171** (wheat poisoning and *Heliotropium europaeum* poisoning), **2176** (*Astragalus pectinatus* and selenium toxicity).

PHARMACOLOGY AND THERAPEUTICS

ANON. (1947.) **Chemical mechanisms of defence.**—*Brit. med. J.* Jan. 4th. 28. **2089**

The author reviews the methods by which drugs are eliminated and detoxicated in the body, *e.g.*, excretion, oxidation, conjugation. The mechanism of antibody formation is then discussed and its remarkable specificity emphasized (for example the antiserum prepared against a protein which has been combined with thyroxin can neutralize thyroid protein in which thyroxin is naturally combined). Anaphylaxis and allergy are embarrassing variants of the same mechanism. For example, in the sensitization of g. pigs against tetryl (an explosive, in the manufacture of which contact dermatitis may be produced), the substance first unites with protein, which then acts as antigen.—J. M. ROBSON.

BRUZELIUS, S. (1945.) **Dicoumarin in clinical use. Studies on its prophylactic and therapeutic value in the treatment of thrombo-embolism.**—*Acta chir. scand.* **92.** Suppl. 100. pp. 219. **2090**

The discovery that the active principle involved in "sweet clover disease" of cattle characterized by a prolonged coagulation time of the blood, was dicoumarin (3–3′ methylene-bis-4 hydroxy coumarin) led to the suggestion that this compound might be of value as a prophylactic agent in various thrombo-embolism conditions. After a short account of the patho-anatomy, aetiology, diagnosis, frequency, earlier treatment and prophylaxis of thrombo-embolism, B. describes the clinical testing of the drug at the surgical clinic in Lund in 1,448 human cases, and compares the incidence and control of thrombosis and embolism following the introduction of the drug with that of a considerable period before the drug was used.

The effect of dicoumarin *in vivo* seems to be an inhibition of the formation of prothrombin or a destruction of prothrombin already formed, and this effect can be followed by daily determinations of the blood prothrombin level. For prophylactic use 0·25 g. dicoumarin is used initially for human patients with supplementary doses graded according to the prothrombin level in the blood. For late prophylactic and therapeutic use 0·5 g. has been employed. The utilization of Quick's index for clinical determination of the prothrombin content of the blood and the use of the index in assessing the dosage of dicoumarin to be employed are described, and the responses in different groups of diseases and operations are summarized.

An account is given of the use of dicoumarin prophylactically and therapeutically. A low incidence of secondary effects such as vomiting nausea, diarrhoea and urticaria follows the use of the drug. The incidence of complications in the form of bleeding from post-operative wounds, etc., is described and such bleedings are broadly classified.

The effect of supplements of vitamin K to counteract the hypoprothrombinaemia in certain cases has been investigated, and large doses of vitamin K have in general been effective; in certain cases it has been necessary to give blood transfusions to increase the prothrombin index. In certain operations even small doses of vitamin K have been effective in cases where hypoprothrombinaemia has occurred during prophylactic treatment by dicoumarin.

It is not yet established whether specific injurious effects to the liver parenchyma have followed the use of dicoumarin. In normal subjects dicoumarin does not increase the blood sedimentation rate, nor has it appeared to enhance significantly this rate in post-operative cases. It does not appear to affect wound healing in experimental and histological investigations in rats, although if haematoma are formed as a result of over-dosage the wound healing may, of course, be affected.—A. EDEN.

BOLLENBACK, C. H., & FOX, S. W. (1946.) **The antibacterial activity of protamine zinc insulin.**—*Science.* **103.** 445–446. **2091**

The antibacterial activity of protamine zinc insulin appears to be due to the protamine as the activity varies with the protamine content of different samples. Zinc insulin itself and the supernatant fluid from a protamine zinc insulin suspension are inactive.—E. BOYLAND.

KLOTZ, I. M., & GUTMANN, H. R. (1945.) **The mode of action of sulfonamides. Dissociation constants of the enzyme-drug complex.**—*J. Amer. chem. Soc.* **67.** 558–565. [Abst. in *Stain Tech.* **20.** 140, copied *verbatim.*] **2092**

The rates of growth of *Escherichia coli* have been followed in the presence of sulfanilamide, sulfathiazole, sulfapyridine and N^1-benzylosulfanilamide. An analysis of the growth curves indicates that competitive inhibition is obtained in each case. Dissociation constants for the enzyme-drug complexes have been calculated and their relation to bacteriostatic activity discussed.

ANON. (1946.) **Sulfamerazine and pullorum disease.**—*Canad. J. comp. Med.* **10.** 300. **2093**

The feeding of sulphamerazine to chicks affected with pullorum disease reduces the mortality rate, but since a proportion of the survivors remain as carriers, such treatment is contra-indicated in breeding flocks. The treat-

ment may be justifiable in broiler plants where all birds are to be disposed of by slaughter and the premises are used for this purpose only.—T. M.

LIVE, I., STUBBS, E. L., & GARDINER, M. R., Jr. (1943.) **The effect of sulfapyridine on cows known to eliminate Brucella abortus in the milk.**—*Amer. J. vet. Res.* **4.** 276–286. **2094**

Six cows were used in these experiments and were treated with sulphapyridine for periods ranging from 11 to 42 days. The drug was administered *per os* at the rate of 7 g. per 100 lb. in three equal doses daily during the first week, 5 g. per 100 lb. daily during the second week and 4 g. per 100 lb. daily thereafter. The maximum concentration of free sulphapyridine in the blood and milk occurred during the first week and was between 8 and 18 mg. per 100 ml. Some bacteriostatic effect was observed, but all milk samples were found to be infected after treatment was discontinued.—S. J. GILBERT.

NUTINI, L. G., & LYNCH, E. M. (1946.) **Further studies on effects of tissue extracts on** *Staphylococcus aureus.*—*J. exp. Med.* **84.** 247–261. [Authors' summary copied *verbatim.*] **2095**

The ability of alcoholic-precipitated extracts of beef tissue—brain, spleen, heart, and kidney—to stimulate the growth of *Staphylococcus aureus, in vitro*, and to convert the yellow S form to a white R variant with altered biochemical characteristics conforming to those of an avirulent organism, has been confirmed.

The avirulence of the white R variant has been established by tests *in vivo* on mice.

Staphylococcus aureus infections induced subcutaneously, intraperitoneally, and intravenously in mice responded favorably to brain extract following subcutaneous or oral administration. The mortality was 2 per cent in 444 experimental animals and 81 per cent in 448 control animals.

The extracts appeared equally efficient when used therapeutically (mortality 2 per cent of 162 experimental animals and 90 per cent in the control series) or prophylactically (mortality 2 per cent of 282 experimental animals and 76 per cent in 286 control mice). Extracts of brain and spleen were more effective than those of either heart or kidney.

Studies concerning the mechanism of action of the tissue extracts indicate that they prevented the formation of toxin by *Staphylococcus aureus*, and had but little effect on toxin actions.

Toxicity tests revealed that the brain and spleen extracts were relatively non-toxic, dosages equivalent to 2 per cent of the body weight being well tolerated. Kidney and heart extracts were much more toxic, producing mortality in dosages as low as 0·3 per cent of the body weight.

—. (1946.) **The intramammary therapy of bovine mastitis. [Committee on Animal Health, National Research Council, U.S.A.]**—*J. Amer. vet. med. Ass.* **108.** 127–135. **2096**

This report assesses the value and indicates the limitations of the chemotherapeutic and antibiotic agents in common use at the present time for the intramammary treatment of bovine mastitis.

The chemical agents discussed are acriflavine, silver oxide, sulphanilamide and iodine, whilst tyrothricin and penicillin are the antibiotics. None of these is considered completely satisfactory but most reliance is placed on penicillin, especially with regard to *Str. agalactiae* infections.

The article is concluded by short answers to 25 leading questions concerning treatment of herds affected with mastitis.—C. D. WILSON.

FOLEY, E. J., LEE, S. W., & EPSTEIN, J. A. (1945.) **The effect of penicillin on staphylococci and streptococci commonly associated with bovine mastitis.**—*J. Milk Technol.* **8.** 129–133. **2097**

In vitro experiments with several strains of Groups B and C streptococci and with staphylococci revealed that penicillin in a concentration of 1 unit per ml. quickly killed young cultures in broth and in milk. The advantages of using penicillin instead of sulphanilamide in the treatment of mastitis are briefly discussed.—J. KEPPIE.

KÄSTLI, P. (1946. Die Behandlung des gelben Galtes der Milchkühe mit Penicillin. **[Treatment of bovine mastitis with penicillin.]**—*Schweiz. Arch. Tierheilk.* **88.** 305–322. **2098**

The main experiments were carried out on a mixed group of cattle with mastitis infections of varying severity and given intramammary infusion of 20,000–50,000 Oxford units in 20–50 ml. distilled water with 12–24 hours' interval. The cows were milked 12 hours after treatment. Up to four infusions were tried in different cases. Every treated quarter was examined bacteriologically after eight days and again after 4–8 weeks. There was no febrile reaction after treatment and a slight temporary reduction in milk yield only in a few cases.

Altogether 89 quarters were treated, of which 93% healed. *Corynebact. pyogenes* infection did not yield to treatment. With streptococcal infections, infusion of 30,000 Oxford units per quarter was only partially effective; two infusions resulted in 80% cures, whilst three infusions achieved 95%. The use of more than 100,000 Oxford units per course of treatment for one quarter gave no better results than a total amount of 100,000 Oxford units. Out of 67 cases, only four recurred after 2–8 weeks.

On one farm, where there were severe and frequent cases of mastitis for many years, three infusions of 25,000 Oxford units in 50 ml. distilled water were given at intervals of 12 hours. Out of 22 treated quarters 20 were cured after the first and the rest after the second infusion.

Before treatment of chronic mastitis a bacterial examination of the herd must be made to discover any latent, non-clinical cases.—C. A.

PORTER, J. J., CAMPBELL, H. M., WEBER, A. F., & REUTNER, T. F. (1946.) **Dosages of penicillin for Streptococcus Agalactiae mastitis.**—*J. Amer. vet. med. Ass.* **109.** 60–64. **2099**

The authors review the dosage, volume of injection and results obtained in treating cases of mastitis with penicillin.

Typical Wisconsin dairy herds were chosen and bulk-sampled to find cows infected with *Str. agalactiae.* All infected cows were then quarter-sampled to establish the number of quarters involved. The cows were divided into four groups according to the number of quarters infected and equal numbers of each group were treated with dosages of penicillin varying from 1,000 to 100,000 units. The volume of each infusion was 500 ml. Each cow was treated three times before being classed as not cured or cured, as judged by three consecutive weeks of negative results to the Hotis test, microscopic examination of milk films and culture on a blood-agar medium.

The results obtained are recorded in two tables giving the percentage of quarters cured with each dose of penicillin and the percentage of quarters cured according to the number injected.

—C. D. WILSON.

SEELEY, H. W., Jr., ANDERSON, E. O., & PLASTRIDGE, W. N. (1945.) **Action of penicillin against mastitis organisms in milk.**—*J. Dairy Sci.* **28.** 887–891. **2100**

A comparative study was made of the effectiveness *in vitro* of penicillin against organisms commonly associated with mastitis and suspended in sterile milk and in beef infusion broth, in which latter medium penicillin is known to be effective.

The organisms were inoculated in known numbers into tubes of sterile skimmed milk containing varying quantities of penicillin and incubated at 37°C. for seven days. The tubes were tested daily by streaking out on blood agar plates and subsequently incubating the plates for viability of the test organisms.

At first large inocula of both penicillin and test organisms were used but later both were reduced, the maximum amount of penicillin being 10 units per ml.

Tables are given showing the action of varying concentrations of penicillin on the several mastitis organisms, the comparative action of penicillin on these organisms in milk and in beef infusion broth and the amounts of penicillin necessary to inhibit their growth after varying times of exposure.

It is concluded that, apart from *Bact. coli*, all mastitis organisms are susceptible to very small amounts of penicillin in milk, that there is little difference in its action whether in milk or in broth and that different strains of organisms within the same species are in most instances susceptible to the same concentration of penicillin.

—C. D. WILSON.

SEMTNER, W. K. (1945.) **Clinical use of penicillin—strangles of horses.**—*Vet. Med.* **40.** 226–227. **2101**

Ten cases of strangles in horses were treated with 5–9 intramuscular injections of 1,000,000 units of calcium penicillin. The drug was administered every 3–4 hours. Six of the horses recovered completely. The others had marked improvement but relapsed 24–48 hours after cessation of treatment. The volume of the injection on each occasion was 20 ml. When the vehicle was distilled water there was some local reaction, but this disappeared within 24 hours. When physiological saline was employed no local reactions occurred.—D. D. OGILVIE.

FISHER, A. M. (1946.) **A study on the mechanism of action of penicillin as shown by its effect on bacterial morphology.**—*J. Bact.* **52.** 539–554. [Author's summary copied *verbatim.*] **2102**

The *in vitro* action of penicillin on staphylococci causes enlargement of the bacterial cells followed by lysis. This is apparently due to interference with their normal stimulus to division and multiplication rather than to complete inhibition of growth.

The same effect is apparent to a lesser degree on cultures of beta hemolytic streptococci and pneumococci. In the case of the pneumococcus at least, the capsule remains intact for some time after the cell body is destroyed.

This effect on the pneumococcus is apparently a biologic rather than a physical or chemical reaction, since it occurs only under conditions in which the organism is capable of growth.

These various morphologic changes are noted to some extent in the staphylococci within the first 2 hours of their exposure to penicillin, and in the streptococci and pneumococci in 3 hours.

The clinical significance of these findings is discussed.

WELCH, H., DAVIS, R. P., & PRICE, C. W. (1945.) **Inhibition of phagocytosis by penicillin.**—*J. Immunol.* **51.** 1–4. **2103**

The toxicity of 60 batches of penicillin sodium to phagocytes has been measured and found to be related to bacteriostatic potency. The concentrations of crude penicillin used in practice are insufficient to inhibit phagocytosis.—E. B.

HAHN, L. (1947.) **Stabilisation of penicillin solutions with sodium citrate.**—*Lancet.* **252.** 408–410. [Author's summary copied *verbatim.*] **2104**

A mixture of sodium citrate in concentrations of *M*/1 to *M*/100 and sodium chloride 0·9% in the proportion of 1 : 4 stabilises sodium-penicillin solutions at 100°C and at room temperature. Preliminary work suggests that, with penicillin-sodium solutions up to 5 units per c.cm., an optimal stabilizing effect is produced with sodium-citrate concentrations of *M*/300 to *M*/400.

The stabilizing effect of this saline-citrate mixture exceeds that of phosphate.

DUGUID, J. P. (1946.) **The sensitivity of bacteria to the action of penicillin.**—*Edinb. med. J.* **53.** 401–412. [Author's summary copied *verbatim.*] **2105**

Quantitative measurements of sensitivity to penicillin have been carried out on a number of strains of each of a variety of bacterial species.

Many strains of those organisms which are usually considered "penicillin resistant" were found to be susceptible to penicillin in concentrations obtainable in infected body fluids.

Under the conditions of the tests, absolute resistance to the action of penicillin was not found in the case of any of the strains or species examined.

Reasons are given for believing that the nature of the action of penicillin on "resistant" organisms is essentially the same as the nature of its action on "sensitive" organisms. The action of penicillin on "resistant" organisms is annulled by penicillinase. As with "sensitive" organisms, the action of penicillin on "resistant" organisms is bactericidal and not merely bacteriostatic; the lowest bactericidal concentration varies with the initial number of organisms present in a given volume of medium; the rate of killing varies with the nutrient value of the medium. Similar characteristic morphological changes are produced in "sensitive" and in "resistant" organisms by effective concentrations of penicillin.

YOUMANS, G. P., FELDMAN, W. H., & DOUB, L. (1946.) **A comparison of the effect of p-amino phenyl sulfone compounds in vitro and in vivo on tubercle bacilli.**—*Amer. Rev. Tuberc.* **54.** 295–298. [Spanish summary: English summary copied *verbatim.*] **2106**

Thirty-three sulfone type compounds were tested *in vitro* for the bacteriostatic activity against virulent human type tubercle bacilli and also *in vivo*, using the same virulent strain of tubercle bacillus, for their ability to suppress experimental tuberculosis in the guinea pig. All compounds that were effective *in vivo* were also bacteriostatic *in vitro*, except for 3 compounds that could be decomposed *in vivo* to compounds that would be active *in vitro*.

Eight compounds were active *in vitro* but were inactive *in vivo*.

The significance of these results is discussed.

YOUMANS, G. P., & DOUB, L. (1946.) **The relation between chemical structure of sulfones and their bacteriostatic activity. *In vitro* studies with virulent human type tubercle bacilli.**—*Amer. Rev. Tuberc.* **54.** 287–294. [Spanish summary: English summary copied *verbatim.*] **2107**

Fifty-nine sulfone compounds were tested *in vitro* for their bacteriostatic activity for the virulent human type tubercle bacillus H37Rv. The relationship between the chemical structure of these compounds and their tuberculostatic activity is discussed.

HINSHAW, H. C., FELDMAN, W. H., & PFUETZE, K. H. (1946.) **Streptomycin in treatment of clinical tuberculosis.**—*Amer. Rev. Tuberc.* **54.** 191–201. Discussion pp. 202–203. [Spanish summary: English summary copied *verbatim.*] **2108**

Streptomycin is a therapeutic antibiotic substance highly effective against tuberculosis of experimental animals and is of low toxicity for man. We have used this drug in treatment of a variety of tuberculous lesions in a series of 75 patients. The results observed are consistent with the hypothesis that streptomycin exerts a suppressive effect on the progress of tuberculous infection in man. Limitations to the intensity of the antibacterial activity and possibly to its duration have been demonstrated.

Streptomycin may represent the first clinically feasible antibiotic remedy for tuberculosis, but at this time it cannot be recommended as a substitute for accepted therapeutic procedures, the efficacy of which have been proved by long experience.

GREENVILLE-MATHERS, R., PICKERING, D., & HALES, G. R. (1946.) **Experiences with promanide in tuberculosis.**—*Brit. J. Tuberc.* **40.** 68–73. [Authors' summary copied *verbatim.*] **2109**

Our experience with promanide in tuberculosis is described. Systemic treatment of pulmonary cases was found to be valueless. Used locally for cold abscesses and laryngitis, excellent results were obtained; and the improvement found in two intestinal cases and one urogenital case was

promising. No confirmation was found of the previous finding that, with oral medication, the urinary excretion of promanide, estimated colorimetrically, is higher than the actual intake.

ELSON, W. O. (1945.) **The antibacterial and fungistatic properties of propamidine.**—*J. infect. Dis.* **76.** 193–197. **2110**

The antimicrobial properties of propamidine against Gram-positive and Gram-negative organisms and against fungi have been investigated *in vitro*. The substance is highly effective against many Gram-positive organisms and fungi but much less against Gram-negative organisms. The fungistatic action is antagonized by phospholipoid and is less effective at a low pH. The mechanisms of action of hydrogen ion concentration and phospholipoid are discussed.—J. M. ROBSON.

ROSS, R. W. N. L. (1946.) **Inhibition of various clostridia by penicillin in human serum.**—*J. Path. Bact.* **58.** 441–447. **2111**

Penicillin was found to have an inhibitory effect on the growth of five strains of *Cl. welchii* when it was added to tubes of brewer's medium in a concentration of 0·1–0·8 unit per ml. Growth could be completely inhibited, or markedly delayed with the production of abnormally filamentous forms. A strain of *Cl. septicum* and one of *Cl. oedematiens* were similarly affected. The effective concentration of penicillin in serum samples could be assayed by incubating microcultures in slide-cells along with various dilutions of the serum sample. *Cl. welchii* under such conditions was 2–30 times less sensitive than the standard staphylococcus, but the same *in-vitro* test revealed that the serum of adults after an intramuscular injection of 100,000 units of penicillin maintained a fully bacteriostatic concentration of penicillin for 1¾–3 hours.—J. KEPPIE.

STERN, L. S. (1944.) **A new method of treating tetanus.**—*Amer. Rev. Soviet. Med.* **1.** 540–543. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 2. 26, slightly amended. Signed: L. BUXBAUM.] **2112**

Tetanus antitoxin does not penetrate the blood serum barrier; treatment of patients with tetanus must, therefore, be given during the incubation time of the disease. However, patients treated after the onset of the disease by injecting the serum into the cerebrospinal canal by cisternal puncture recovered. Experiments were first conducted on dogs and it was found that when the tetanus antiserum was injected by the usual method, the dogs died; all dogs recovered when the serum was introduced both into the general circulation and into the cerebrospinal fluid, even after the first symptoms appeared. The technique of the injection is important. The Trendelenberg position is used and the spine of the atlas is palpated for a landmark. The point of the needle is placed in the first cervical interspace. Resistance is felt at the dura. The pressure at which the serum is injected must insure its penetration into the cerebral ventricles and exceed that of the cerebrospinal fluid flowing from the ventricles to the subarachnoid space. Several cases cured by this method are cited.

TCHERNOMORETZ, I. (1946.) **[The chemotherapy of piroplasmoses.]**—*Refuah vet., Palestine.* **3.** 54–62. [In Hebrew: abst. from English summary.] **2113**

This is a review of the chemotherapy of the disease up to the present time. No drug has yet been found to have any effect on *Theileria annulata*, *Babesiella berbera* and *Anaplasma marginale*. Acaprin has a marked therapeutic effect on *Babesia bigemina* only. The optimal dose is 1 mg. per kg. body weight. Stilbamidine in doses from 2–4 mg. per kg. body weight is effective in treating infections of *Babesia bigemina* in calves and *Babesiella ovis* in goats. The drug is also effective against leishmaniasis and trypanosomiasis including *T. evansi*. Morphologically abnormal forms of *Babesia bigemina* capable of multiplication were produced by the action of stilbamidine. Brain capillaries blocked by parasitized red blood cells were observed in *Babesiella berbera* infection.

OLDHAM, F. K., & KELSEY, F. E. (1945.) **Studies on antimalarial drugs. The distribution of atabrine in the tissues of the fowl and the rabbit.**—*J. Pharmacol.* **83.** 288–293. **2114**

Rabbits and chickens were injected intravenously, in the ear and wing vein respectively, with 5 mg. per kg. of atebrin dihydrochloride and the rate of disappearance of the drug from various organs was studied at intervals up to 96 hours. The rate of accumulation of atebrin was observed in rabbits and chickens which had received from 1–21 daily injections. Atebrin was more rapidly eliminated in the fowl than in the rabbit and was three times more toxic to the rabbit than the fowl. The chief organs of storage in the rabbit were the lungs, kidneys, spleen, adrenal glands and liver; in the chicken the chief organ of storage was the liver. Atebrin passes through the placenta of the rabbit into the foetus. There was no destruction of atebrin by liver, lung or kidney extracts from either species.—R. MARSHALL.

FILATOV, V. P. (1945.) **Tissue therapy in cutaneous leishmaniasis.**—*Amer. Rev. Soviet Med.* **2.** 484–490. [Abst. in *Trop. Dis. Bull.* **43.** 724–725, copied *verbatim*. Signed: C. M. WENYON.] **2115**

Under the term "tissue therapy" the author describes a procedure which he states is based on a new principle in medicine. He holds that

animal and plant tissues, when preserved under adverse conditions, generate biogenic substances which stimulate healing and regeneration when they are introduced into the body. The introduction may be made by various methods—grafting, implantation, subcutaneous and intramuscular injection, surface applications, rectal injections. The author claims that a great many diseases have been successfully treated by this method; among these cutaneous leishmaniasis is specially mentioned in this paper. This has been treated by grafting on to areas from which a piece of healthy skin has been removed a similar piece of skin which had been removed from a cadaver and had been preserved under refrigeration for a week. Within a few days of the skin graftings, which are made at points distant from the sores, changes occur in the leishmania ulcers and healing takes place in two to three months with a minimum of scarring. Similar results were obtained by grafting the preserved skin of the rabbit or by the injection of extract of the leaves of the aloe which had been preserved in the dark. The author concludes that the cases described in the paper demonstrate the powerful effect which tissue therapy exerts in cutaneous leishmaniasis. Grafting of conserved skin and subcutaneous injection of an extract of preserved aloe leaves are equally effective. Tissue therapy acts by virtue of systemic stimulation, independently of the aetiology of an ulcerative process. Thus, tuberculous ulcers, syphilitic ulcers and leishmania ulcers are equally benefited. The paper is illustrated by a series of photographs showing the results of treatment of leishmania ulcers by the author's method.

Remlinger, P., & Bailly, J. (1946.) La pénicilline est sans action dans la rage. [**Penicillin without effect in rabies.**]—*Arch. Inst. Pasteur Algér.* **24.** 29–31. **2116**

A suspension of brain substance from a rabbit which died as a result of inoculation with fixed rabies virus was mixed with 10 ml. of a solution of penicillin containing 5,000 Oxford units and kept in a refrigerator. Samples taken one hour, 16 hours and 24 hours later were injected subdurally into two dogs and two rabbits, all of which developed rabies. Brain material from a rabbit which died after injection of street virus was treated in the same way and after aninterval of 24 hours was injected subdurally into a dog, a rabbit and two white mice, all of which developed rabies after the normal incubation period.

In two rabbits infected with fixed virus the intramuscular injection of penicillin at three-hourly intervals did not prevent death nor did it modify the symptoms or duration of the illness.

—M. C.

Eigenmann, T. F. (1944.) Die Therapie der infektiösen Bronchopneumonie des Rindes mit sterilem, hochaktiviertem Lebertran. [**Therapy of bovine bronchopneumonia with sterile cod liver oil of high vitamin A potency.**]—*Schweiz. Arch. Tierheilk.* **86.** 1–15 & 55–65. **2117**

This disease, of which the symptoms are a rough cough, fever, increased pulse and respiratory rates and dyspnoea, with head stretched forward, may attack a whole herd, especially the young animals. In severe cases there is discharge from the nostrils, salivation and conjunctivitis. The causal agent is considered to be a pneumotropic virus though organisms such as cocci, bipolar bacilli and *Corynebact. pyogenes* have been found secondarily. Onset of the disease is favoured by adverse weather conditions, exhaustion after long-distance transport and unsuitable diet, in which a lack of vitamin A plays an important part. The animals lose weight quickly and the mortality is about 30%. The illness may last 1–2 weeks, but in fully established cases of broncho-pneumonia the duration may be 3–4 weeks. Many methods of treatment and a wide range of therapeutic agents have been tried, including ethyl iodide, ether, salvarsan and sulphonamides, without being entirely satisfactory. Good results have been obtained with activated cod liver oil. In one herd where there had been outbreaks for three years, this infectious broncho-pneumonia quickly responded to cod liver oil therapy and further similar successes were reported with seven other herds.

In one group of animals which had verminous bronchitis in addition to broncho-pneumonia, treatment was with ordinary medical cod liver oil as the activated oil was not available. The results were not satisfactory: three animals out of ten had to be slaughtered. Whether the quality of the oil or the complicating bronchitis verminosa was the cause of failure is not known.

E. recommends the subcutaneous injection of 40 ml. of cod liver oil containing 3,000 I.U. of vitamin A and 1 I.U. of vitamin D per gramme of oil. Medical cod liver oil is stated to have a content of 1,250 I.U. of vitamin A and 1·5 I.U. of vitamin D. All animals in an affected herd should receive treatment, sick animals being given further doses once or twice after 1–2 days. E. considers that successful treatment is the result of the action of vitamin A. It is important as an epithelial protecting agent and a lack of it favours the invasion of the mucosae by pathological organisms.

—P. Sasse.

Davidson, O. G. (1945.) **Penicillin therapy in a case of secondary canine distemper.**—*Vet. Med.* **40.** 250–251. **2118**

Penicillin treatment of a Dachshund dog which for 7–8 days had clinical signs of canine distemper with pulmonary involvement led to rapid improvement in the condition and eventually to complete recovery. Eight doses of 10,000 units administered intravenously or intramuscularly were given over a period of four days.—D. D. O.

COOPERMAN, J. M., LICHSTEIN, H. C., CLARK, P. F., & ELVEHJEM, C. A. (1946.) **The influence of thiamine on the susceptibility of chicks to avian encephalomyelitis.**—*J. Bact.* **52.** 467–470. [Authors' summary copied *verbatim.*] **2119**

One-day-old white leghorn chicks, divided into 3 groups receiving a low, suboptimum, and optimum level of thiamine, were inoculated with a virus suspension of avian encephalomyelitis. The chicks receiving the highest level of thiamine were protected to the greatest degree.

In another series 1-day-old white leghorn chicks were given an optimum level of thiamine in the ration for 2 weeks, then divided into 3 groups receiving levels of thiamine as indicated in the previous experiments for 2 weeks, at the end of which time they were inoculated. In this case the chicks receiving the lowest level of thiamine were protected to the greatest degree.

HOAGLAND, C. L., LABBY, D. H., KUNKEL, H. G., SHANK, R. E. (1946.) **An analysis of the effect of fat in the diet on recovery in infectious hepatitis.**—*Amer. J. publ. Hlth.* **36.** 1287–1292. [Authors' summary and conclusions copied *verbatim.*] **2120**

A comparative study has been made between the effects of a diet low in fat and high in protein and a diet relatively high in fat and high in protein on the period required for recovery in 70 patients with infectious hepatitis in whom there was moderate to marked acute liver insufficiency.

No harmful effects were observed to follow the administration of a diet high in fat in patients in whom the intake of protein was kept correspondingly high. Indeed, the diet high in fat appeared to have decided advantages over the diet low in fat with respect to the maintenance of an adequate caloric intake, particularly in the acute stages of the disease. With the former diet, weight loss was minimal in the acute stages of hepatitis and gain in weight maximal in convalescence. Added evidence of the superiority of the high fat high protein diet was indicated by the results of serial tests of bromsulfalein retention which revealed normal levels for the patients on the high fat, high protein diet earlier than the group on the high protein, low fat regimen.

MUDD, S. (1945.) **Can chemotherapy be extended to include the intracellular disease agents?**—*J. Bact.* **49.** 527–537. **2121**

This article deals with the investigation of cell metabolic systems and their selective inhibition by chemotherapeutic sulphonamides.

M. considers that the critical sites of chemotherapeutic action are to be found within the system of respiratory enzymes which mediate the aerobic and anaerobic oxidation of glucose and its derivatives. These respiratory enzymes are proteins reversibly combined with co-enzymes and M. concludes that the drug acts by forming an inactive compound with either or both of the protein and the coenzyme. The article refutes the Woods-Fildes theory that sulphonamides inhibit an enzyme or enzymes associated with the anabolism of *p*-aminobenzene acid.—R. F. G. S.

PARROT, J. L. (1941.) Sur la dose anesthésique de chloralose chez le chien ; sa proportionnalité a la puissance 2/3 du poids de l'animal. [**The anaesthetic dose of chloral hydrate in the dog.**] —*C. R. Soc. Biol. Paris.* **135.** 731–734. **2122**

The relationship of the minimal anaesthetic dose of chloral hydrate, administered intravenously, was shown to be proportional, not directly to the body weight of the dog, as usually assumed, but to the $\frac{2}{3}$ power of the body-weight. Thus the dose in g. (Q) is obtained by raising the body-weight in kg. (P) to the power of $\frac{2}{3}$ and multiplying by the factor 0·28. Thus:–

$$Q = 0{\cdot}28 \times P^{\frac{2}{3}}.$$

This relationship shows considerable divergence from the linear relationship, especially in the case of small dogs, and may thus be of considerable practical importance. This relationship appears to be generally applicable to other substances.

—H. S. MCTAGGART.

GARNHAM, P. C. C. (1946.) **The efficacy of insecticidal sprays in aircraft.**—*E. Afr. med. J.* **23.** 272–277. [Author's summary copied *verbatim.*] **2123**

A simple test (using mosquitoes in cages as an indicator) to check the efficacy of the disinfestation of aircraft is described. All parts of a flying-boat are shown to be accessible to insecticides, if used in sufficient concentration, with the unimportant exception of the bullion locker. Mosquitoes protected by a layer of thin cloth are largely unaffected by insecticides, unless these are used in impracticably high concentration. Mosquitoes remain inside coat-sleeves for periods up to an hour, even when the coat is roughly handled, and this possibility constitutes a potential danger.

JONES, L. M. (1946.) **Some aspects of the pharmacology of DDT.**—*N. Amer. Vet.* **27.** 492–494. **2124**

J. reviews the existing information relating to the pharmacology and toxicology of D.D.T.,

including susceptible insect species, the mode of action, preparations available, toxicity for domestic animals, and the excretion of the compound in the butter-fat of lactating animals.—J. L. McGirr.

Smith, C. N., & Gouck, H. K. (1946.) **Observations on tick repellents.**—*J. econ. Ent.* **39.** 374–378. **2125**

A satisfactory laboratory test of tick repellents has not yet been evolved. The most consistent results were obtained when attached ticks were counted on persons who walked, stood or sat in tick infested areas, results being compared with counts made on subjects whose skin or clothing had been treated with the repellent. Materials tested included indalone, dimethyl phthalate, Rutgers 612 (2-ethyl-1,3-hexanediol), pyrethrum, bisethylxanthogen, D.D.T. rotenone - sulphur dusts, and 6–2–2, consisting of six parts dimethyl phthalate, two parts indalone and two parts Rutgers 612 (by volume). Of these, indalone and 6–2–2 gave the most satisfactory results, but under the conditions of trial, none gave total protection and it was necessary to repeat treatments of clothing twice weekly.—G. B. S. Heath.

Twinn, C. R. (1946.) **DDT and its application in veterinary medicine.**—*Canad. J. comp. Med.* **10.** 301–315. [French summary.] **2126**

The paper summarizes the more important uses for farm animals. It appears to be a safer insecticide than several now in use. It should not be applied in oily solutions and should be kept from direct contact with food materials. It is extremely toxic for flies and mosquitoes even in minute quantities and has an effective residual toxicity for varying periods. Residual spray should consist of a 5% D.D.T., 1 gal. of which will cover 1,600 sq. ft. of surface. Of 36 species of black flies reported in the Dominion, one (*Simulium arcticum*) causes illness and death of cattle in Saskatchewan. D.D.T. is effective against this species by use in streams or sprayed from an aeroplane. Sprays are highly effective against the horn fly of cattle. D.D.T. has little or no effect on bot and warble flies. Dipping or spraying is valuable in the control of blow flies and keds. The drug is very effective in the control of fleas, both the adult and larval forms being susceptible. Bed bugs and lice are destroyed. D.D.T. is not recommended for treatment of cats.
—P. J. G. Plummer.

Florio, R., Moularde, G., & Lézy, P. (1941.) A propos de la thérapeutique chlorurée hypertonique dans la myoglobinurie paroxystique du cheval. [**Hypertonic salt solutions in the treatment of myoglobinuria paralytica in horses.**]—*Rec. Méd. vét.* **117.** 193–209. **2127**

The authors subscribe to the theory that myoglobinuria paralytica of horses is an auto-intoxication of muscular origin, associated with a disturbance of sugar metabolism during muscle contraction. This in turn leads to a necrosis of muscle fibres causing a liberation of poisons leading to auto-intoxication. These facts suggest that the administration of a detoxicating agent is indicated and for this purpose hypertonic salt solution appears to be suitable. In developing the argument in favour of this treatment the authors quote from the literature regarding muscular metabolism and the treatment of conditions having features similar to equine myoglobinuria.

Fourteen clinical cases of myoglobinuria were treated by intravenous administration of doses of 200–300 ml. of a 20% solution of salt. Several doses per day were given, the total daily administration being 600–1,000 ml. On improvement the doses were reduced to 300 ml. per day. Twelve animals recovered.

Considering the actual state of our knowledge the authors recommend confining this saline treatment to serious cases and accompanying it by the classic symptomatic treatment.—J. S. S. I.

Pincemin, Y. (1945.) La myoglobinurie du cheval et son traitement. [**Treatment of myoglobinuria in the horse.**]—*Bull. Acad. vét. Fr.* **18.** 18–32. **2128**

P. discusses the orthodox view of the aetiology of myoglobinuria and describes an heroic treatment said to meet with considerable success in cases of paraplegia. Seven case histories are included to illustrate the application of this treatment, which consists of severe blood-letting, even up to 12 l., followed by the intravenous administration of 2 l. of oxygen at a rate not exceeding 5 ml. per sec. with frequent interruptions to minimize the risk of air embolism. It is recommended that this administration of oxygen be repeated daily, if necessary, for 4–5 days.
—W. M. Henderson.

Jones, V. B. (1946.) **Seborrhoea oleosa equinus.**—*Vet. J.* **102.** 285–288. **2129**

After giving an account of the clinical stages of development of the lesions of "grease", J. describes a method of treatment which has good results, except in the most advanced cases. The hair is closely clipped and the affected area is thoroughly cleansed with soft soap and warm water, rinsed well, dried with a cloth, and allowed to dry out completely in the open air. Twice daily sulphanilamide powder is briskly rubbed in until the affected area shows an evenly dusted appearance. In a few days, when the area becomes dry, the daily washing is stopped, but the brisk dressings are repeated until all the lesions have

gone, the period of treatment varying from a few days to some weeks.—E. COTCHIN.

MOSIER, J. E. (1946.) **New treatment for bovine stomatitis.**—*Vet. Med.* **41.** 433–434. **2130**

Successful treatment of 17 cases of contagious bovine stomatitis with "benadryl" (beta-dimethyl-aminoethyl benzhydryl ether hydrochloride) is recorded. Four animals received 120 mg. of the drug *per os* three times daily for two days, three animals 300 mg. twice daily for two days and the remainder 50 mg. per 100 lb. body weight once daily. In only one case did the treatment extend over more than two days. All animals recovered promptly. Lesions around the nose and mouth disappeared, sometimes within 72 hours of commencing treatment.—D. D. OLGILVIE.

RIX, J. C. (1945.) **General anaesthesia by intravenous injection of chloral hydrate combined with sodium citrate as used by the French Army Veterinary Service in North Africa.**—*J. R. Army vet. Cps.* **16.** 234. **2131**

Intravenous administration of chloral hydrate with sodium citrate is now used exclusively by French army veterinarians for general anaesthesia in the horse. Cocaine hydrochloride (0·3 g. in 5 ml. water given intravenously) is employed to control the duration of the anaesthesia and is injected as soon as the operation is completed. The dose of chloral is calculated on body weight, *viz*, 11 g. per 100 kg. in a litre of water. Half of this quantity of sodium citrate is added and the whole dose injected. Surgical anaesthesia persists for 2–3 hours or until terminated by the cocaine injection.—D. D. OGILVIE.

PETERSON, L. W. (1945.) **Prophylaxis of wound infection: studies with particular reference to soaps and irrigation.**—*Arch. Surg.* **50.** 177–183. **2132**

Various methods of cleansing contaminated wounds have been used from time to time. One of the most popular consists in thorough application of soap and water only. Although the germicidal properties of soap are unquestionable and it is obviously not very irritating to tissues, the superiority of soap and water over other methods has never been experimentally demonstrated. For this reason tests were made in both clean and contaminated wounds in a series of 76 dogs. In uncontaminated wounds all types of soap caused a definite but slight irritation. "Green" soap was found to be more irritating than "white" soap.

Of the various methods studied, the best means of cleansing contaminated wounds appeared to be gentle irrigation with isotonic saline utilizing the force of the stream as the washing mechanism.—D. D. OGILVIE.

See also absts. **1932** (penicillin and *Corynebacterium renale* infection), **1937** (streptomycin and plague), **1891** (serum and Newcastle disease treatment), **2087** (carbon tetrachloride poisoning), **2088** (D.D.T. sprays), **2171** (phenothiazine), **2172** (phenanthridinium in Kenya), **2175** (many sulphonamides).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

CHERTKOVA, F. A., KANTSUR, M. J., & SALANT, M. E. (1940.) K voprosu ov otravleniyakh vrynzoĭ. [**On intoxication with sheep cheese.**] —*Probl. Nitrit., U.S.S.R.* **9.** 69–71. [Abst. in *Dairy Sci. Abstrs.* **3.** 210, copied *verbatim.*] **2133**

Illness due to the consumption of sheep's milk cheese (Brinza) was investigated in April, 1936; 25 people each of whom had consumed 50 to 150 g. of the cheese were concerned. Analysis for alkaloids, arsenic and the heavy metals did not reveal any abnormal quantities, but bacteriological examination revealed the presence of the anaerobe *Bacillus perfringens*, which was absent from normal Brinza. *Bacterium coli* and *B. subtilis* were present however in both kinds. *B. perfringens* was traced in the sheep's milk and the authors show that in the past, presence of the organism in other foods has been accompanied by similar symptoms. When cultures of the organism, which in broth produces a toxin, were inoculated subcutaneously into cats and guinea pigs, the illness was reproduced and in some cases even proved fatal.

BERBERIAN, D. A. (1946.) **Cheese poisoning in Syria and the Lebanon.**—*J. Palestine Arab med. Ass.* **1.** 30–37. [Abst. in *Bull. Hyg., Lond.* **21.** 530–531, copied *verbatim.* Signed: W. G. SAVAGE.] **2134**

Cheese poisoning is by far the commonest form of food poisoning in Syria and the Lebanon, but as it is not notifiable no figures of incidence can be given. It is usually contracted from local green cheese, made from goat's or sheep's milk and only occasionally from cow's milk. The cheeses are produced locally in small quantities by farmers, villagers and dairymen; they have a central hole in which salt is placed. The symptoms of poisoning are nausea, vomiting, diarrhoea, prostration, and muscular cramp, but not all the symptoms are present in each case. The incubation period is from 1–2 hours up to 6 hours. The attack is rarely fatal and recovery takes place in

1 to 3 days. Outbreaks usually occur in individual families. The author considers the various possible causes and concludes that the outbreaks are due to staphylococcus food poisoning. In four outbreaks pieces of cheese were available, and in each the predominating organism was *Staphylococcus aureus*, varying in numbers from 2,760,000 to 10,560,000 per gramme of cheese. Animal tests for enterotoxin production were not possible.

Only part of a batch of cheese may be poisonous and not all those who have eaten of the same poisonous cheese are liable to be affected.

RAY, G. (1946.) Nettoyage et stérilisation des récipients et utensiles utilisés en laiterie. **[Cleaning and sterilization of dairy utensils.]**—*Chim. et. Industr.* **55.** 23–30. [Abst. in *Bull. Hyg., Lond.* **21.** 323, copied *verbatim*. Signed: W. G. SAVAGE.] **2135**

In this long article the author discusses the subject comprehensively, but no new investigations are included. He sets out in a table the relative advantages and disadvantages of steel and aluminium for milk containers, and then mentions various alloys. He concludes that unoxidizable steel containers are the most satisfactory, if their price can be reduced. He mentions that alloys containing chromium and nickel (Staybrite) are very satisfactory. Churns in France are mostly of 20-litre capacity, but some of 40-litre are used. They are of tinned steel, and are easily indented. Various aluminium alloy substitutes are mentioned, but no one metal is recommended. At Havre, containers of aluminium with 1·5 per cent. or 2·5 per cent. of magnesium are being used. The author compares the relative merits of transit in churns and large tanks, and favours the latter. As regards the composition of tanks, he mentions tinned steel, aluminium and aluminium compounds, but does not mention glass-lined steel tanks.

All the usual points as to cleanliness, disinfection and sterilization in the milk depot are discussed. Sterilization by boiling water, steam and dry heat are all considered, and the author regards dry heat as simple and very satisfactory. The uses and limitations of chemical sterilization are dealt with. Hypochlorites are mainly considered and he favours the use of these instead of steam for the small installation.

PULLINGER, E. J. (1946.) **An example of low butter-fat production by a high-grade Friesland herd.**—*J. S. Afr. vet. med. Ass.* **17.** 81–84. **2136**

Bulk samples of milk were examined over a period and the results are tabulated and discussed. The cows were in good condition and well fed. The butter-fat content was very low, varying from 1·9 to 2·5%. Solids-not-fat were on the high side, from 8·395 to 8·935%. Samples from individual cows gave similar results: some cows gave milk with only 1·4% butter-fat in the morning milk.

The causes of the low fat content are discussed. P. considers that the most probable cause is the tendency of breeders to select cows for high yields without paying sufficient attention to the fat content. The result in this herd is said to be typical of those in S. African dairy herds.—M. C.

HINER, R. L., MADSEN, L. L., & HANKINS, O. G. (1945.) **Histological characteristics, tenderness, and drip losses of beef in relation to temperature of freezing.**—*Food Res., Ill.* **10.** 312–324. **2137**

Five-day-old beef samples cut 1½ in. thick and frozen at 18°, –10° and –40°F. at –40°F. in an air blast, and at –114°F., increased consistently in tenderness as the temperature was lowered and the time of freezing shortened. This increase in tenderness was considered to be due to increased fibre rupture caused by intrafibrillar ice formation, as well as to stretching and rupturing of the interstitial connective tissue. Increased intrafibrillar freezing and rupturing of fibres, permitting the proteins to re-absorb a large proportion of the water originally frozen in the meat were thought to be the cause of the fact that drip during subsequent thawing decreased as freezing temperatures were lowered from 18° to –114°F.

—LIONEL M. MARKSON.

EMLEN, J. T., Jr., & STOKES, A. W. (1947.) **Effectiveness of various rodenticides on populations of brown rats in Baltimore, Maryland.**—*Amer. J. Hyg.* **45.** 254–257. [Authors' summary copied *verbatim*.] **2138**

Five poisons (ANTU, thallium sulfate, 1080, zinc phosphide, and arsenic trioxide) gave good or moderately good kills when presented in a standard corn bait to groups of wild brown rats in a large indoor pen; two (strychnine sulfate and fortified red squill) gave poor kills.

Of 3 poisons selected as reasonably safe for field work in residential communities and exposed in various bait preparations to free-living populations in city-block test units, only one (ANTU) gave good kills. Best results were obtained when ANTU was used with a combination of several bait bases.

MADISON, R. M. (1946.) **The National Institute for Veterinary Research of Korea.**—*J. Amer. vet. med. Ass.* **109.** 450–452. **2139**

The laboratory is described and illustrated. It is stated to be " the largest biological laboratory in the Orient " [the description suggests however, that it is considerably smaller than, for example,

the Imperial Veterinary Laboratory at Mukteswar in India]. The institute covers an area of 25 acres and is divided into six departments. Both research and large scale production of sera and vaccines are carried out. The library contains over 10,000 volumes and contains all the important veterinary journals in the English language prior to 1941. One of the main activities is the production of smallpox vaccine, about four and a half million doses of which were produced during the first five months of the allied occupation.—M. C.

DIXON, O. H. (1946.) **The role of veterinary medicine in the occupation of Japan.**—*J. Amer. vet. med. Ass.* **109.** 445–449. **2140**

Following the occupation of Japan by the allied occupation forces in 1945 a survey of disease control and meat and dairy inspection showed that these activities had been seriously disrupted during the war. Orders were given to establish disease control measures and for the monthly reporting of outbreaks of anthrax, blackleg and foot and mouth disease.

The organization of veterinary services in Japan is described. Three ministries are concerned. The Ministry of Agriculture and Forestry deals with disease control, quarantine, research and vaccine production, the Ministry of Health and Social Affairs is responsible for meat and dairy inspection and the Ministry of Education for the veterinary colleges. There were 21,818 licensed veterinarians in Japan in 1943. There are 23 veterinary colleges, government controlled and private, with approximately 4,000 students in normal times. The course leading to a bachelor's degree takes three years. The entrance requirements of the colleges vary greatly. Teaching is largely by lectures and demonstrations, laboratories and facilities for clinical instruction being very deficient. There are four government laboratories for manufacture of sera, vaccines and other biological products. The Japanese army had 5,024 veterinarians, ranging in rank from second lieutenant to lieutenant general.

A table gives the incidence of the major diseases in 1945. [It is of interest to note that eight cases of rabies in bovine animals are listed, although no cases in dogs are mentioned.] The very high numbers, 9,286 cases, of osteomalacia [osteofibrosa] in horses indicates serious nutritional deficiency.

The organization of veterinary services in Korea is also described.—M. C.

ANON. (1946.) **A veterinary college for Ceylon.**—*Trop. Agriculturist.* **102.** 1–3. **2141**

In the past, Ceylonese veterinary surgeons have been trained in one or other of the Indian veterinary colleges. Difficulty is now experienced in obtaining admission to these colleges. There are 40 veterinary surgeons in Ceylon at present and it is estimated that an increase to 200 is required. Annual replacements are estimated at " not more than 10 ". To meet the situation the establishment of a veterinary college in Ceylon is considered necessary and the necessary preliminary steps have been approved by the Minister of Agriculture.—M. C.

—. (1946.) **Post-war training for the colonial service. Report of a Committee appointed by the Secretary of State for the Colonies.** Colonial No. 198. pp. 46. London: H.M. Stat. Off. 8vo. 9d. **2142**

This pamphlet contains a memorandum by Major Sir RALPH FURSE, drawing attention to the deficiencies in the present training for the colonial services and suggesting the lines on which extended education and training should be given, and a report of a committee composed of members of Oxford, Cambridge and London universities on the implementation of the suggestions.

Major Furse points out that in the future the colonial services will have to meet a cross fire of criticism from home, the dominions and foreign countries, as well as from the colonies themselves, and that a British colonial service containing international elements is even possible. He stresses that there is no provision for advanced or refresher training, except in the medical and forestry services, that in the non-scientific services research is conspicuously lacking in many fields; that the members of the colonial office have no opportunity of getting the theoretical experience given to the men with whom they must co-operate and that training is largely confined to an individual's own branch and does not provide for sympathetic co-operation with other departments: these are serious defects.

He emphasizes that serving officers should be brought into contact with opinion in this country and should take stock of opinion in foreign countries and the dominions, that the training for a particular colony should be set against the wider background of the colonial empire, that a unified colonial service is needed, not a series of services, administrative, agricultural, etc., tending to work in watertight compartments and thus promoting conditions under which the local administrator may regard the veterinarian as a nuisance, and the veterinarian may regard the administrator purely as a provider of porters. He submits that training should have two objectives: " to lay the foundations on which every officer can develop his full effectiveness over the whole period of his service, and to make him efficient as soon as possible." Both aims seem to be best secured

if the training of all officers consists of two periods of theoretical study divided by an apprentice tour of service in a colony. Later in their career selected officers should be given special leave for advanced study. Major Furse also predicts that the service will have to deal with a new type of coloured man and owing to a widening of the basis of recruitment, a new type of white officer whose special qualities must not be emasculated, but who may need knowledge of the historical background of colonial society.

He suggests that all colonial administrative officers should have a preliminary course of training, a period of apprenticeship in a colony, and then a second course at home; and in the case of other services, that the pre-war courses should be revived, the early years in the colonies be treated as apprenticeship and all officers be brought together in the second course for administrative officers with suitable modifications, or extensions, for individual needs. Four suggestions were made as to the location of such courses, but it was decided that colonial studies slould be distributed amongst the universities, and in the first instance the co-operation of the Oxford, Cambridge and London universities was invited. In discussing university facilities he mentions that there are already medical courses at Edinburgh and Liverpool and a veterinary course at Edinburgh. [This was closed down in 1940.]

The rest of the memorandum is mainly concerned with the training of administrators, but it is of interest that special consideration is given to colonial recruits and that it is suggested that colonial office officials, dominion officers and foreign colonial administrators be invited to attend the courses, and some provision be made for " unofficial whites " and the wives of officials.

The university committee suggest that the first course of study for administrators should be 15 months, and the second course seven months, with a summer school in September and two terms spent in one of the three universities. The first course is to include agricultural and animal husbandry studies, and it is also suggested that tropical hygiene, sanitation, house-keeping and cookery be included, and that if possible visits be arranged to such colonial educational centres as Achimota and Makerere. The committee also suggest that specialist services should receive some instruction in British colonial policy, a language course and, if possible, a regional course in geography and sociology.

For the second course it is proposed that lectures be cut to a minimum and that teaching be by seminars, at which papers written by members are read and discussed.

The second course would largely emphasize departmental co-operation, and it is suggested that the professional advisers to the colonial office and other experienced persons should help. The necessity of sending professional officers to where they can best get specialist training may interfere with liaison training, but it is claimed that satisfactory distribution can be made except in the cases of education and forestry. It is considered essential that libraries, centres of information, colonial service clubs and living accommodation be provided, and it may be necessary to foster the writing of suitable textbooks.—U. F. R.

See also absts. **1921** (bovine TB. in man), **1944** (food poisoning from duck's eggs), **1957** (botulism in France), **1964** (canine leptospirosis in man), **1965** (bovine leptospirosis in man), **1966** (swineherd's disease), **2162** (emergency slaughter).

ZOOTECHNY

WANDERSTOCK, J. J., & SALISBURY, G. W. (1946.) **The relation of certain objective measurements to weights of beef cattle.**—*J. Anim. Sci.* **5.** 264–271. **2143**

The correlation between various body measurements and weight in fat stock was studied.

There was significant correlation between the measurements of the heart girth, the height at withers, patella, and body length and the weight. The most significant single measurement for establishing weight was the heart girth.

The well known formula

$$\frac{G^2 \times L}{300} = \text{weight in lb.},$$

where G = heart girth in in. and L = body length in in., gave the most reliable results.—M. C.

BLUM, J. (1939.) Über die Dauer der Trächtigkeit beim Rind. [**Duration of pregnancy in cattle.**]—*Mitteil. Naturforsch. Ges. Kt. Glarus.* **6.** 111–120. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 1. 9, copied *verbatim.* Signed: H. SIMONS.] **2144**

The gestation period in the cow is 277–304 days ± 1 day (av., 289·12 ± 0·027 days). In primiparous cows the gestation period is 1 day below the av., in ♂ calves 0·4 day above, in ♀ calves 0·4 day below and in twin deliveries 1·6 day below the av. The treatment of ♀ animals and, the degree of using the bulls kept for breeding influence the gestation period. Distribution of births within physiological limits differs from those computed. This discrepancy is to be

explained by incomplete suppression of the sexual cycle during gestation.

RIEMERSCHMID, G., & ELDER, J. S. (1945.) **The absorption for solar radiation of different coloured hairy coats of cattle.**—*Onderstepoort J. vet. Sci.* **20.** 223–234. **2145**

The absorption of heat from the sun by the skin of cattle of various breeds was studied. Hides, but no living animals were used and readings were taken with a Moll-Gorezinsky solarimeter, an instrument consisting of a blackened receiving surface built up by a series of thermophile elements covered by ten glass domes. Full details of the method of use are given.

The colour of the hair was the most important factor affecting the total percentage of radiation absorbed. Mean effective absorptivity was 49% for white Zulu cattle, 78% for red Afrikander and 89% for black Aberdeen Angus.—M. C.

O'MOORE, L. B. (1947.) **Sex hormones in the urine of pregnant cattle.**—*J. comp. Path.* **57.** 36–46. **2146**

Urines from cows, bulls, bullocks and a heifer calf were extracted for pregnandiol by various methods. The residue was not pure, as judged by the melting point. The quantity extracted varied widely and gave no indication as to whether the animal was pregnant. Further investigation on suitable methods of extraction is obviously necessary. Tests for oestrogenic activity of the urine as a method of pregnancy diagnosis are only reliable after the 140th day.—J. M. R.

CROSS, B. A. (1946.) **Animal behaviour in relation to veterinary science.**—*Vet. J.* **102.** 397–409. **2147**

C. reviews the reports of other workers. He does not deny the possibility of purely psychic processes helping to determine behaviour, but leaves this out of account for the present and takes purely a mechanistic view. As far as nutrition is concerned, it has apparently been shown that all species of animals have a highly efficient power to select an optimum diet for themselves, if allowed sufficient freedom of choice. Optimum water intake occurs only when it is constantly available. From the aspect of animal pathology the existence of purely neurotic disease, in dogs at least, has been clearly demonstrated: C. considers that this phenomenon can bear much closer investigation, especially as a neurotic factor may complicate other disease of organic origin. Physical neurology should also receive much more attention as a research subject. The section on sexual behaviour consists of a series of isolated anecdotal abstracts, and displays a lack of acquaintance with recent literature on bull behaviour at artificial insemination centres.

The article ends with constructive suggestions for the organization of research into animal behaviour in veterinary institutions.

—F. L. M. DAWSON.

BARRIOS, S. A. (1945.) Informe de la seccion de zootecnia y veterinaria. **[Information given by the veterinary department of the Ministry of Agriculture in Guatemala on the cattle situation in 1944.]**—*Rev. Agric., Guatemala.* **1.** 318–332. **2148**

In October, 1944, the office of Zootechny was absorbed into the newly formed Directorate of Cattle Breeding, Game and Fisheries. The Directorate instructs farmers in milk recording and collects and publishes records of the volume and fat content of milk and enters proven sires of pure breed in a Registry of Merit. Free veterinary advice is given on disease control, feeding, hygiene and pasture improvement.

An outbreak of anthrax on a farm on which all the stock had been vaccinated proved the necessity for more careful testing of vaccines and sera before issue. The infection was thought to have been brought with some cattle imported from Honduras. Fifty-two calves died and 364 were protected with anthrax antiserum administered intravenously. Various haematozoa are common and cause some losses, but are most troublesome in that their symptoms frequently resemble those of bovine encephalomyelitis, a disease that has not yet been recorded in Guatemala, although common in Mexico, where it is carried by bats. Fasciola hepatica is the next most troublesome parasite usually affecting sheep, but sometimes cattle; plans for its control are being formulated.

The cattle population has decreased, according to official figures; but it is believed that this is a fallacy, as a result a new census form being issued to breeders which they did not understand. Slaughter figures remained stationary.

—R. MAGREGOR.

See also absts. **1963** (financial loss caused by trichomoniasis in dairy cows), **2001-2010** (artificial insemination), **2136** (low butterfat production by Friesian cows), **2175** (heat tolerance in Jersey and Friesian cattle).

TECHNIQUE AND APPARATUS

BUSH, M. T. (1946.) **Glass bacteriological filters arranged for positive pressure.**—*J. Bact.* **51.** 531–532. **2149**

Where small volumes of fluids have to be filtered frequently, the use of glass bacteriological filters together with positive pressure is recommended. A glass filter can be used for successive samples without any loss in filtering efficiency.

The use of positive pressure is convenient where fractions of the filtrate are required, as the receiving containers can be quickly changed. B. illustrates the most suitable proprietary units of glassware, having ground-glass joints and some form of vacuum-gauge.—J. KEPPIE.

CONN, H. J., & DIMMICK, I. (1946.) **Filters suitable for separating soil bacteria from bacteriophage.**—*J. Bact.* **52.** 489–491. [Authors' summary copied *verbatim.*] **2150**

It is evident from this work that unsatisfactory results obtained in handling bacteriophage may frequently be due to the type of filters employed. Apparently, some of the types of filters (e.g., the asbestos pad type), which have been reported to give the best results with bacteria from milk, do not prove so satisfactory with soil bacteria. Under the conditions employed in this laboratory and with the particular soil bacteria under investigation, none of the American-made porcelain candles gave as good results as did the Berkefeld grades N and W, which are no longer available. The best results of all were secured with filters of sintered glass.

CHANDLER, V. L., & SHAW, R. D. (1946.) **Dropping device for cylinder plate assay of penicillin.**—*Science.* **104.** 275. **2151**

The method requires a hardened, seeded agar layer in a standard Petri dish upon which sterile cylinders are placed vertically. The solutions under test are pipetted into the cylinders and the Petri dish is incubated. A diagram illustrates the apparatus. A platform, which can be raised 1 in. and on which the agar plate is placed horizontally, is surmounted by four vertical tubes in which the sterile cylinders are placed and from which they are dropped about ½ in. on to the raised plate. The actual placing of the cylinders upon the agar is important. The test solution diffuses through the agar and the clear zone of inhibited growth of the organism may be compared with zones produced by standard solutions on the same plate.—LIONEL M. MARKSON.

FIELDING, J. (1947.) **A simple method of estimating penicillin and other bacteriostatics.**—*Brit. med. J.* Jan. 25th. 136–137. **2152**

The method depends upon observation of acid and clot production by the standard Oxford staphylococcus M growing in a glucose-serum medium held in capillary tubes or in test tubes. The method can be used with different carbohydrates and different micro-organisms.—E. B.

HILLES, C. H., & HAMBURGER, M., Jr. (1944.) **Experience with the slide agglutination and the capillary precipitin methods for typing hemolytic streptococci.**—*J. infect. Dis.* **75.** 265–269. **2153**

The typing of over 300 strains of Group A streptococci was attempted by means of a slide agglutination test: 169 were typed successfully and were found to belong mainly to Types 1, 6 and 12. Because of auto-agglutination, cross agglutination, or absence of any reaction, the remaining 164 strains could not be typed. They were subsequently classified easily by means of the capillary precipitin test using sera prepared by Lancefield. Eighty-nine strains which had failed to react in the aggln. test despite prolonged subculturing were found in precipitin tests to be mainly, of Type 18 but also of Type 19 and others. Seventy-five strains which had given confusing cross agglutinations, were in clear-cut precipitin tests shown to be largely of Type 19 or 17. The precipitin test, using the stable hydrochloric acid extracts of the streptococci, was thus shown to be more reliable, specific and time-saving in the typing of this species than was the agglutination test.—J. KEPPIE.

HUNTER, G. J. E. (1946.) **A simple agar medium for the growth of lactic streptococci: the role of phosphate in the medium.**—*J. Dairy Res.* **14.** 283–290. **2154**

A solid culture medium has been evolved for the routine culture of bacteria commonly associated with milk and dairy products. It is especially suitable for maintaining lactic streptococci such as *Str. cremoris* at the peak of their activity, but has also been shown to be useful for the other common streptococci. Among the essential ingredients are beef extract and peptone, especially a brand having a high concentration of the more complex nitrogenous fractions. A relatively high content of di-sodium phosphate was proved of value for buffering the medium and because it formed with the agar a growth-promoting substance for lactic acid bacteria. This latter factor was removed during the filtration of the medium through paper-pulp, and therefore this process had to be avoided. Such unnecessary filtration of agar media is discouraged because of the accompanying loss of nitrogenous and buffering substances which results in relatively poor and slow growth. The final composition of the medium was as follows:– 2% agar, 1% beef extract, 2% lactose, 1% peptone, 10% yeast extract, and 0·6% di-sodium phosphate. The ingredients are dissolved with steaming, the pH is adjusted to 6·8 and 15 ml. quantities are tubed and autoclaved.—J. KEPPIE.

QUORTRUP, E. R. (1946.) **An improved method of testing for botulinus toxin by the use of penicillin.**—*J. Amer. vet. med. Ass.* **109.** 214–215. **2155**

Large numbers of samples of water and soil etc., were examined for the presence of *Cl.*

botulinus toxin. Candle-filtration was found to remove the toxin from samples containing only a small amount, but penicillin added at a rate of 26 units per ml. of crude material was of considerable help in reducing the number of mice dying not from specific toxin but from the contaminating bacterial flora. Specific toxin present in the samples was unaffected by the penicillin. —J. KEPPIE.

LIEM, S. D., & VAN THIEL, P. H. (1940–41.) **The complement-fixation test for Chagas' disease employing a dried culture antigen.**—*Acta leidensia.* **15–16.** 259–274. [Abst. in *Trop. Dis. Bull.* **43.** 719–720, copied *verbatim.* Signed: J. F. CORSON.] **2156**

Tests of a dried antigen prepared from a culture of trypanosomes on horse blood glucose agar are described. The strain of trypanosomes was isolated at Hamburg in 1935 by MALAMOS from *Macaca irus* [*Macacus cynomolgus*] recently arrived from the Netherlands East Indies; it was identified by Malamos as *T. cruzi.* The authors received the strain in the bug *Triatoma infestans* in 1936.

The sera of rabbits immunized by intravenous injections of cultures of the trypanosome, and the sera of dogs infected with it, were used for antibody, while guineapig serum provided the complement. The sera of two persons in South America who were suffering from Chagas's disease were sent to the authors at Leiden, Holland, and gave negative results in the complement fixation test, but, owing to the time taken in transit, no conclusion can be drawn from the tests. As a control, 365 sera of patients in Holland, suffering from various diseases, were tested: 4 out of 146 Wassermann-positive sera were positive and 4 out of 6 sera patients suffering from chancroid were also positive, but all the other sera were negative.

The authors conclude that the dry antigen used, which is sealed *in vacuo* in ampoules and kept in the refrigerator, is better than other antigens, and they recommend its trial in known cases of Chagas's disease in South America.

CROSS, J. B. (1945.) **A rapid fixation technique for Trematoda and Hirudinea.**—*Texas Reps Biol. Med.* **3.** 101–104. [Abst. in *Helminth. Abstr.* **14.** 53, copied *verbatim.*] **2157**

If livers infected with Fasciola in mammalian Ringer's solution are left overnight in a refrigerator almost all the worms migrate into the fluid. If cigarette paper is inserted between the flukes and glass slides when the usual method of fixing them under pressure is adopted, complete penetration by the fixative is almost instantaneous. Details are given of the procedure whereby large numbers of flukes can be dealt with rapidly by this method.

KORNHAUSER, S. I. (1945.) **A revised method for the "quad" stain.**—*Stain Tech.* **20.** 33–35. **2158**

This method differs from the original [see *V. B.* **14.** 218] in that aluminium ammonium sulphate is substituted for aluminium sulphate and a pH of 2·9 is adopted for the final staining solution, since this gives the sharpest and bluest nuclei and clearest transparent and contrasting cytoplasm of a pinkish hue. The revised method is given in full detail.—LIONEL M. MARKSON.

GOMORI, G. (1946.) **Staining of chromaffin tissue.**—*Amer. J. clin. Path.* **16.** 115–117. **2159**

Heidenhain's azocarmine modification of Mallory's aniline blue collagen stain is suggested as a specific stain for chromaffin tissue.—L. M. M.

CAPPELL, D. F., HUTCHISON, H. E., & SMITH, G. H. (1947.) **Marrow biopsy. Preparation and use of paraffin sections from sternal-puncture material.**—*Brit. med. J.* March 29th. 403–404. **2160**

Sternal puncture smears being of limited value in haematology and marrow trephining being both uncomfortable for the patient and necessitating a full surgical operation, the authors devised a method combining the technical advantages of the former with the histological advantages of the latter. This method consists of aspirating bone marrow fluid as usual, fixing in diluted Zenker-formol (minus the acetic acid), washing in distilled water and then dehydrating, clearing, embedding, sectioning and staining the marrow fragments. Photomicrographs illustrate the efficacy and value of this method.—LIONEL M. MARKSON.

VAN BRUGGEN, J. T. (1945.) **Determination of hemoglobin. The use of a buffer as the laking fluid to overcome errors inherent in the carbonate method.**—*J. Lab. clin. Med.* **30.** 611–615. **2161**

The photometric determination of haemoglobin in blood by laking with dilute sodium carbonate solution was found to be inaccurate since, except at low room temperatures, there was an appreciable change in the haemoglobin with corresponding change in absorption spectra. By laking with dilute phosphate buffer or commercial "tablet" buffer (sodium tetraborate and potassium acid phosphate) at pH 8·0, a solution of haemoglobin was obtained which gave constant photometer readings for up to four and a half hours. —R. MARSHALL.

STRAUS, R., & FAIGIN, R. (1946.) **Simplified test for fragility of erythrocytes.**—*Amer. J. clin. Path.* **16.** 437–441. **2162**

An erythrocyte count is made in the usual way with pipette, diluent and counting chamber.

The sample of blood under test is then treated similarly but using a 0·45% aqueous solution of sodium chloride as diluent. The amount of haemolysis is calculated from the difference between the two counts. The various other techniques for estimating erythrocyte fragility are briefly discussed.—LIONEL M. MARKSON.

SCHÖNBERG, F. (1944.) Die Natronlauge-Kochprobe als weiteres Hilfsmittel zur objektiven Feststellung des Ausblutungsgrades im Fleisch schlachtbarer Haustiere. [**Sodium hydroxide test for degree of bleeding of food animals slaughtered (in emergency).**] — *Z. Fleisch- u. Milchhyg.* **54.** 110. **2163**

When haemoglobin is boiled with alkalies, iron-containing haematin and iron-free globin are formed. In this test, 5 g. of meat to be examined is macerated and boiled for 10 min. in 40 ml. decinormal sodium hydroxide. The fluid is removed to a test tube and after cooling, the colour, which becomes yellow to brown-red, indicates the quantity of blood contained in the meat.—C. AHARONI.

SPÖRRI, H., & LEEMANN, W. (1946.) Die Beurteilung der Herzkraft bei kranken Tieren durch das Elektrokardiogramm. [**Determination of heart action in sick animals by means of the electrocardiogram.**]—*Schweiz. Arch. Tierheilk.* **88.** 113–133. **2164**

Opinions vary as to the value of results obtained in measuring the actual mechanical efficiency of the heart by means of the electrocardiogram. A discrepancy between the mechanical and the electrical phenomena of the heart action has been recorded in various diseases in human beings. In some cases in which the mechanical (haemo-dynamical) systole is shortened, the length of the electrical systole (the QT-distance in the electrocardiogram) is normal or even markedly prolonged.

The following observations on the length of the electrical systole are of importance.

The QT-distance was established for normal animals. It is dependent mainly upon the frequency of the heart beat and a series of the average, maximal and minimal values for the horse, the ox and g. pig are given. Seven equine hospital cases are described in detail. Diagrams and tables summarize the observed results and include those of other species, bovine, canine and laboratory animals. In all these cases a markedly prolonged QT-distance was observed under varying pathological conditions, *e.g.*, TB. malignant oedema, blackleg, leptospirosis, equine infectious anaemia, adrenal insufficiency, hypocalcaemia, nephritis and hepatitis. Large doses of barbiturates have also been found to extend the electrical systole period.

The apparent discrepancy between the prolonged electrical QT-distance and the shortened mechanical and haemo-dynamical systole is explained as follows :– An early valvular closure does not necessarily mean the end of muscular contraction; at the beginning of the second heart sound the haemo-dynamically active systole is probably completed, but some parts of the heart muscle may still be in a contracted state and thus give rise to a difference of potential. In some cases the retarded phase of systolic contraction seems to be a definite symptom of diminished contractile power.

Another reason for the prolonged systole may be the inferior quality of the vital substances available for the heart's metabolism. If there is a lack of energy-producing substances, the heart requires more oxygen for the production of an equal amount of work. As the insufficiency is latent, the power of the heart appears normal, but a prolonged QT-distance is registered by the apparatus.

Metabolic deficiencies of the heart probably occur more frequently in domestic animals than in human cases.

The test for heart efficiency, made by driving the animal a short time and then listening to its heart, is apt to give a wrong picture, because the accelerated respiration may compensate to a great extent for the failure of the heart.—C. AHARONI.

SCHALL, E. D., & THORNTON, M. H. (1943.) **Methods for determination of fat in dog food.** —*J. Ass. off. agric. Chem., Wash.* **26.** 404–407. [Abst. in *Biol. Abstr.* Sect. F. **19.** No. 2. 23, slightly amended.] **2165**

The fat content of ingredients used in canned dog food as determined by acid hydrolysis methods was always higher, regardless of the nature of the material analyzed, than that shown by ether extraction. On the basis of glycerol determination, the true fat present in the ether extract and the acid hydrolysate extract of the dog food was found to be 98·8 and 68·5%, respectively. Therefore, it appears that approximately 30% of the extract given by the acid hydrolysis method consists of materials other than fat. If the extracts are considered on the basis of the quantity of true fat present, the results are approximately the same regardless of the method used.

STERN, K. G., & REINER, M. (1946.) **Electrophoresis in medicine.**—*Yale J. Biol. Med.* **19.** 67–99. [Authors' conclusion copied *verbatim.*] **2166**

From the foregoing discussion it is evident that the diagnostic value of the Tiselius technique

in the field of clinical medicine does not lie in the absolute specificity of electrophoretic patterns for specified diseases. The protein spectrum in plasma and serum is the resultant of a host of factors concerned with the formation, the interaction, and the destruction of the individual components. The blood, while often considered a tissue in itself, is perhaps more dependent on the physiological state of the organism as a whole than is any other tissue. It is, therefore, only natural to find that there exists a close correspondence between the blood, the protein system, and the physiological state of the individual as a whole, rather than to a given pathological condition.

This explains why in all diseases accompanied by fever and tissue destruction the concentrations of the α-globulin components are significantly increased and why in all instances, with few exceptions, where an antigen-antibody system is involved specifically, the γ-globulin concentration is found to be markedly elevated. There is a strong indication that future work in this field might most profitably be focused on long-range studies in which an attempt is made to correlate the clinical course of various diseases with shifts in the electrophoretic patterns of the blood and plasma of selected patients, with due consideration to the effect of therapeutic measures on these variables. In any event, there can be no doubt that the electrophoretic analysis of serum protein affords a more detailed and reliable picture of this labile biological system than does any other chemical or physical chemical method used thus far, including even the ultracentrifugal method of analysis. Not only does this new tool yield accurate values for the albumin/globulin ratio but it yields quantitative information on a whole series of well-defined blood proteins which cannot be differentiated by other methods and which, no doubt, are of primary importance in the physiology of the organism.

MISCELLANEOUS

FLÜCKIGER. (1947.) Schlussbericht über die Tätigheit des Schweizerschen Zentralkomitees für tierärtzliche Hilfe an kriegsgeschädigte Länder. **[Final report of the activities of the Swiss Central Committee for veterinary aid to war-damaged countries.]**—*Schweiz. Arch. Tierheilk.* **89.** 151–153. **2167**

During 1945-46 the Swiss Central Committee for veterinary aid to war-damaged countries collected among Swiss veterinary surgeons a sum of about Fr. 10,000; the same amount was put at their disposal from outside sources.

New and used instruments, pharmaceutical products and books were sent to France, Austria, Holland, Czechoslovakia and Poland for distribution among veterinarians.—C. AHARONI.

ANON. (1945.) État actuel de cheptel et de la production laitière en France. **[Present condition of dairy cattle numbers and of milk production in France.]**—*Lait.* **25.** 286–288. **2168**

The effect of the war on the cattle, sheep, goat and pig populations in France is discussed. Cattle are estimated to have decreased by 17%, sheep by 40%, goats by 30% and pigs by 50%, as compared with the 1938 levels. Milch cows are estimated to have decreased by a million and milk production is less by about one-third.—M. C.

BOBRINSKOY, N., KUZNETZOV, B., & KUZYAKIN, A. (1944.) Opredelitet mlekopitayushchikh SSSR. **[Mammals of the U.S.S.R.]** pp. 440. Moscow: "Sovietskaya Nauka." [English preface.] [Abst. in *Trop. Dis. Bull.* **43.** 268, copied *verbatim.* Signed: CHARLES WILCOCKS.] **2169**

This is a useful reference book, compiled "to aid any person somewhat familiar with the subject to determine the specific name of any of our mammals, and to receive a more or less complete information on the geographical distribution of the mammal on the territory of this country", though the information concerning the more remote areas is as yet incomplete.

Keys are given, and for each species there are notes on morphology and biology. The geographical distribution is summarized in 62 maps at the end of the volume. There are many line drawings of skull and tooth structure, and 32 half-tone plates of most attractive pastel and wash drawings (in monochrome) of the animals in their natural surroundings.

To the epidemiologist the long section on the Rodentia will be of most value.

LUDWIG, P. (1941.) Die Arbeiten des Internationalen Tierseuchenamtes in Paris seit seiner Gründung im Jahre 1921 bis zum Ausbruch des europäischen Krieges im September 1939. **[The work of the *Office Internationale des Epizooties* from its foundation in 1921 until September, 1939.]**—*Inaug. Diss., Berne.* pp. 71. **2170**

This is a handy summary of the history and activities of the *Office Internationale des Epizooties*, situated at Paris. This institution was set up as a result of a conference to discuss the international control of animal diseases, which was convened in 1920 by the French government and thrown open to all countries. Twenty-eight countries agreed in 1921 to found jointly and to support the new

" office " and up to 1939, 19 further states had joined. The scope of activities and statutes of the " office " are set out in full and a resumé is given of the recommendations of the annual general meetings held during 1927–39 and of the principle steps taken to control the more important diseases on an international basis.

In 1939, the " office " was able, partly by financial grants, to stimulate research into active immunization against foot and mouth disease, but this of course became inoperative at the outbreak of war.

One of the aims of the " office " has been to urge all countries to contribute statistical reports of livestock diseases: this has been done to a useful extent and these records have been published by the " office ". It has, however, been difficult to obtain standardized data from the many countries involved. Scientific reports of the annual meetings of the " office ", as well as general abstracts on the progress of livestock disease control and also of relevant legislation have been published in the *Bulletin de l'Office Internationale des Epizooties*.—J. E.

REPORTS

AUSTRALIA. (1945.) **Ninth annual report of the Australian Wool Board for year 1944-45.** pp. 20. Items of veterinary interest pp. 8–16. Melbourne: Stockland Press. 4to. **2171**

Notes are given on appointment of officers, the Wool Use Promotion Act, a mobile unit for showing films dealing with control of animal diseases, etc., and wool advertising.

The modified Mules' operation is now used by many sheep owners and gives a high degree of prevention against crutch strike. The medium-long tail further reduces the incidence of crutch strike. In a group of lambs tailed during a period of fly activity the incidence of strike in tail wounds was :– short tails, 21%, medium, 7·5%, and medium-long, 4·3%. A further plastic operation is being developed in order to reduce tail strike. Provided dipping was carried out efficiently, a 0·2% solution of sodium arsenite was just as effective against the body louse, *Bovicola*, as arsenic-sulphur or arsenic-phenol preparations. Dipping in a suspension of Timbo root (8 oz. per 100 gal.) did not destroy 100% of body lice and although it destroyed all adult keds (*Melophagus*), it did not destroy pupae. An emulsion containing 1 : 5,000 D.D.T. killed all adult keds and sufficient remained in the fleece to destroy young keds subsequently emerging from pupae. A dilution of 1 : 2,500 was highly efficient against body lice. Studies on the bionomics of *Bovicola ovis* showed that lice do not consume or injure wool fibres, that while they can live on material scraped from the surface of the sheep's skin, the life-cycle is speeded up by the addition of dried yeast, that eggs will only hatch if kept at temperatures near those of the body (none hatch at 32°C., or if kept at 27°C. for two days and then at 37°C.), that eggs take 9–11 days to hatch, that the period from egg to egg ranged from 30–50 days, and that lice are less susceptible to humidity than to temperature changes. The heaviest louse populations were found along the mid-line of the back. Lesions on the legs of sheep on the black earths of the central highlands of Queensland were due to *Trombicula sarcina*, Womersley, 1944. The mites cause irritation to man. Grey kangaroos are natural hosts.

Administration of phenothiazine in salt-licks did not give satisfactory control of *Trichostrongylus* spp. or *Oesophagostomum columbianum*. Methods of administration of phenothiazine were studied in order to reduce the chances of staining of the fleece. Owing to wartime shortage of nicotine sulphate, attention was given to the use of tetrachlorethylene, with particular reference to its combination with copper sulphate. Studies on the seasonal incidence of the internal parasites of sheep were continued at a number of centres in eastern Australia. These studies are providing information on the influence of seasonal conditions on fluctuations in worm burden and in consequence provide indications for the timing of the anthelmintic treatment.

" Self-cure " has been observed on many occasions, and although the sheep throw off their infestations, reinfestation may occur soon afterwards. The phenomenon has been seen simultaneously in flocks of sheep on pastures some 20 miles apart. " Self-cure " is not due to death of worms from old age. Further observations showed that infestations with *Dictyocaulus filaria* increase in the autumn, reach highest levels in winter and decrease markedly and suddenly in spring. Sub-clinical infestations with *Trichostrongylus* spp. resulted in reduced food intake, loss of body weight and reduced wool production. Infestations with *Oesophagostomum columbianum* caused marked loss of appetite (from 2·5 lb. feed per head per day to 1·5 lb. within three weeks after infection took place), which persisted for over 30 weeks. Body weights and wool growth were correspondingly reduced.

Breeding investigations included studies on accession to sexual maturity in Merino ewes,

inheritance of faults in conformation and wool characters and associations between fleece characters. The fundamental seasonal rhythm of sexual activity of ewes was not affected by access to green feed at various periods of the year. On certain pastures in which a markedly vigorous strain of subterranean clover was dominant, sheep showed several disturbances in breeding activity. Fertility was low and there was trouble at lambing time, with dead unborn lambs and prolapse of the uterus in non-pregnant ewes. Rams utilized vitamin A very efficiently in relation to fertility, but on low levels of intake they appeared to be more susceptible to other causes of interference with fertility. Inco-ordination of gait was found in the terminal stages of vitamin deficiency. Scaliness of parts of the genital tract is also related to deficiency of this vitamin. The possibility that augmented oestrogen production in late pregnancy may result in loss of appetite and hence precipitate PREGNANCY TOXAEMIA was being investigated.

In studies on nutrition wheat was fed to sheep in quantities of 2 lb. per head per day without causing ill-effects. Coarsely-ground limestone was found to be less effective than finely-ground in offsetting the adverse effects of a low calcium-high phosphorus diet. When diets comprised of wheaten chaff with oats, maize or wheat were not supplemented with ground limestone there were adverse effects on appetite, growth, dentition and wool production. Calcium and phosphorus in meat meal and bone meal were poorly utilized by sheep. Dental abnormalities seen in sheep on the low calcium-high phosphorus diets resembled those seen following excessive intake of fluorine. Analyses of soil "licks" habitually used by sheep showed that many contained a high percentage of calcium carbonate, some were rich in magnesium carbonate and a few contained more sodium chloride than is usually found in soils. Wool grown by sheep on diets deficient in copper had reduced tensile strength. Chronic fluorosis was seen in regions watered by some artesian bores.

Progeny testing of Merino rams was continued. It was found that a ram may be ranked similarly on individual characters when successive observations are made on the same progeny, *e.g.*, at one year and two years of age, and when the same rams are retested with a different, random selection of ewes. Some rams ranked quite differently if judged on their ram progeny only from when judged solely on their ewe progeny.

Proteins of high biological value, *e.g.*, casein, appear to have a protective action against liver damage associated with TOXAEMIC JAUNDICE. A low intake of protein from the forage probably contributes to liver damage associated with storage of large amounts of copper. Grazing on *Heliotropium europaeum* increased the incidence of toxaemic jaundice, apparently because it favours a high copper intake by the sheep. When molybdenum is present in high concentration in plants it may cause copper deficiency in the animals. It seems possible that, if molybdenum is in very low concentration in the plant a very high copper status may be attained by the grazing sheep.

Pasture investigations included comparisons of seeded pastures and natural pastures, grazing management, rates of stocking, inter-row cultivated pastures, etc.—H. McL. GORDON.

KENYA. (1946.) **Annual report of the Veterinary Department, 1945.** [DAUBNEY, R.] pp. 28. Nairobi: Govt. Printers. 8vo. **2172**

For European stock the year was more favourable than 1943, because of heavier short rains: the effect of these was shown in the second six months by a rise in the creamery butter production, which was 3,000,000 lb. out of a total of 4,732,000 lb. for the year. The Naivasha Creamery produced 264,000 lb. of Cheddar cheese. Rainfall for the year was below average. The Kenya dairy industry was protected against a sudden fall in the price of butter fat by an agreement between the Ministry of Food and the Governments of Australia and New Zealand. The price in 1944 was Sh. 1/50 per lb.

The Pig Industry Committee submitted a final report to the Government emphasizing the value of pig keeping as a complement to any butterfat-producing dairy industry and making recommendations for feeding, import of stock, equipment of factories, etc. The report was favourably received. A cold store with a capacity of 1,200 tons was to be erected on the quay at Mombasa. Pig production was on the same scale as in 1943, although foodstuffs in short supply caused a deterioration in the quality of baconers. The Pig Control handled 43,029 pigs. Out of 1,566 pigs passed through the native pig finishing station at Nyeri, ten were condemned, seven for infection with *Cysticercus cellulosae*. Live Stock Control obtained more native cattle from reserves (96,186 as against 91,166 in 1943), but purchases of native sheep and goats fell by about 35% to 158,240 because of drought. A wastage of meat twice during the year added further weight to the case for seasonal killing and refrigeration. A second consignment of the Juba River type of heifer was introduced from Somalia and distributed to farmers after quarantine; the quality was high and they were superior to indigenous native cattle as foundation stock, because of their higher milking capacity.

Cattle breeding, Central Insemination Centre plans and the position of disease, are generally reviewed. The danger of spread of CONTAGIOUS ABORTION, TRICHOMONIASIS and CERVICO-VAGINITIS in the dairy herds is recognized and a special plea is made for co-operation between the Government and the stock-owners in order to reduce the incidence of the diseases. A systematic plan is required such as has been effected against the more spectacular major disease of RINDERPEST, and to this end a plan is suggested for contract veterinary services on a contributory basis. If the industry is to achieve the efficiency necessary for world competition, the first step must be towards greater veterinary supervision of the health of dairy herds. The problem created by the presence in settled areas of large numbers of "squatter" stock is reviewed; surveys continue. Accurate vital statistics of cattle population in reserves were obtained during the mass immunization and branding of stock.

In the settled areas, there were 69 reported cases of ANTHRAX during the year. There was an increase in ULCERATIVE LYMPHANGITIS and CELLULITIS in horses and cattle and quarantine restrictions were tightened up. Calfhood vaccination with strain 19 and "O" strain was becoming popular for the control of BOVINE CONTAGIOUS ABORTION. There were 111 reported cases of BLACKLEG. No fresh outbreaks of BOVINE CONTAGIOUS PLEURO-PNEUMONIA occurred during the year. Use of the complement fixation test enabled existing quarantines to be lifted in some instances. Cases of TRYPANOSOMIASIS continue to occur; one outbreak originated from relapse of treated animals followed by mechanical transmissions and another from the introduction of a few flies by passing convoys of donkeys. No fly could be found in the affected areas. TRICHOMONIASIS was diagnosed for the first time in Kenya in the Limuru area and may be more widespread than is apparent. Research work is being carried out to differentiate it from specific CERVICO-VAGINITIS. Fifty-eight fresh outbreaks of EAST COAST FEVER occurred in clean areas; in one instance buffaloes were responsible. In affected areas control is improving, and new cattle dips built have reduced the incidence of tick-borne disease generally. All areas were involved in outbreaks of FOOT AND MOUTH DISEASE. Abortion, calf mortality and sterility were common complications. Quarantine control was difficult to apply and the alternative measure of immunization was being considered. One outbreak of RABIES was recorded in the Sotik district. Few cases of AFRICAN HORSE SICKNESS were recorded, because of annual vaccination. There were 14 outbreaks of RINDERPEST. Prophylactic inoculations carried out by the staff were as follows:– K.A.G. virus, 78,185; K.A.G. virus plus serum, 7,904; vaccine alone, 384. Vaccine issued direct to farmers totalled 57,136 doses. In the lower Nanyuki area, reports of severe mortality from JAUNDICE in cattle were investigated and appear to be due to some condition other than ANAPLASMOSIS. Four outbreaks of EAST AFRICAN SWINE FEVER were recorded. In one, a policy of slaughter and incineration terminated the spread of infection immediately. Specific disease causing sterility was on the increase, as a result of increased sales of breeding stock and faulty technique in artificial insemination.

In native areas and preserves the practice of vaccinating against ANTHRAX and BLACKLEG continued to make headway with native stock-owners, 78,086 and 114,376 head respectively being vaccinated against diseases. Existing outbreaks of BOVINE CONTAGIOUS PLEURO-PNEUMONIA were effectively controlled except in two areas, the Masai and Meru reserves, where difficulty was encountered in holding cattle for long enough to complete vaccination. Total vaccinations in native areas were 1,083,737. Wastage amongst bovines from TRYPANOSOMIASIS was severe. 10,585 head of cattle in affected areas were treated with phenanthridinium, stibophen, antrypol or tartar emetic. In Central Kavirondo, reclamation of riverine bush continues at a cost of Sh. 11/83 per acre and maintenance of cleared areas costs Sh. 9/16 per acre. Survey of other "fly" areas continues. Progress in dipping and culling to eliminate tick-borne disease is being made. RABIES remains a serious problem in Nyanza Province, and in the Kitui reserve diagnosis had been secured from a human brain. No serious outbreak of RINDERPEST was reported from any reserve, mass immunization in 1943 having apparently been effective in control. 708,770 cattle were immunized with K.A.G. virus.

Laboratory services included the production of sera and vaccines, figures for which are given and compared with those of 1943, routine diagnosis, for which also figures are given (for example, 18,314 complement fixation tests were carried out for the diagnosis of BOVINE CONTAGIOUS PLEURO-PNEUMONIA), food analyses, the staff acting as scientific advisors to the Feedstuff and Fertilizer Control, and research work, which was hampered by the volume of routine investigations and the limitations imposed by war.

A comparative study of *Br. abortus* strain 19 and the Kabete "O" Strain was continued: the antibody response in calves was similar in both cases. Experiments in the treatment of ULCERATIVE CELLULITIS with sodium sulphapyridine, soluseptacine, vaccine and bacterial fractions are

described ; some successful results were obtained but no effective treatment applicable to all cases had yet been discovered. The use of strains grown in 10% glycerin broth as seed has been continued with success in vaccination against CONTAGIOUS BOVINE PLEURO-PNEUMONIA.

Experiments in the transmission of TRYPANOSOMIASIS continue. *Glossina austini* is a good vector of *T. brucei* ; *G. longipennis* can transmit *T. congolense* more regularly than *G. palpalis*, but less regularly than *G. austini*. A trypanosome of the *T. congolense-T. simiae* group was isolated from wild *G. pallidipes* and was successfully transmitted to pigs by the fly. A feline strain of *T. brucei* has maintained its neurotropic properties in pigs and another camel strain causes the same syndrome. A bovine strain of *T. congolense* with marked translatory movement was studied. A survey of trypanosome species in camels was made ; an examination of 170 thick smears from various game animals were examined and proved negative. Chemotherapeutic tests were made with phenanthridinium 1553 in six cases of *T. congolense* infection in cattle ; cures were obtained at dose rates of 1·25 and 1·5 mg. per kg., and a 1 or 2% solution is necessary in large animals. The drug appears as effective as phenanthridinium 897, but its irritant properties render it less suitable for use subcutaneously. 4 : 4,Diamidino-*a-b* dimethyl stilbene (M & B 991) was shown to be ineffective against *T. congolense* in cattle in doses of 1–20 mg. per kg. given subcutaneously ; intravenously, 13·4 mg. per kg. injected as a 4% solution effected a cure. The solution does not become more toxic on exposure to light.

In studies on EAST COAST FEVER, it was shown that the development of *Th. parva* can be arrested during the moult from the larval to the nymphal stage of ticks exposed to high temperatures. Evidence was also obtained that *Th. parva* dies out when *R. appendiculatus* are kept for periods over one year.

Three strains of field virus of FOOT AND MOUTH DISEASE were adapted to g. pigs, two of "A" type and the third appearing to have a strong " C " component. Attempts were being made to produce a neurotropic variant of "A" type in mice. Trials of a new method of vaccination of cattle were begun but were not described. Four Kenya strains reached the 74th, 49th, 45th and 39th passages respectively ; in addition a new strain was adapted to mice and was in its 30th passage at the end of the year. Efforts to obtain virus of BOVINE MALIGNANT CATARRH from lymph node cells were unsuccessful. A study of the histology of enlarged nodes is described briefly ; the main change was the draining of small lymphocytes from gland tissue and the accumulation of excess cell free fluid. Attempts to produce an inactivated vaccine against SWINE FEVER met with no success. Details of trials with crystal-violet, light exposure in the presence of methylene-blue and the use of spleen tissue instead of blood are given briefly.

Studies carried out on helminths are not described in detail. It was confirmed that eggs of *Taenia saginata* remain viable on pasture for six months. Experiments on immunization against *Cysticercus bovis* are described briefly. Malachite, when placed in water, yielded a copper concentration of 0·5–1·0 p.p.m. which was suitable for snail destruction. The following parasites were determined at Kabete for the first time :– *Acanthocheilonema dracunculoides* (Cobbold) from a dog, *Onchocerca armillata* (Railliet and Henry) from cattle, *Suifilaria suis*, *Dicrocoelium hospes* (Looss) from a sheep.

A series of milk analyses showed that in Kenya the breed has a marked influence on the solids-not-fat content of milk, Friesians and often Ayrshires yielding a content of 8·5% : native cows give a satisfactory content. This may be due to lack of green grazing in dry months, affecting the lactose content : further analyses were to be carried out.

Studies on the following aspects of reproductive physiology were carried out and are reviewed :– (a) the buffering capacity of seminal fluid, (b) the specific gravity of semen, (c) the glucose content of semen, (d) the storage of sperm, (e) the fertilizing capacity of sperm, (f) the functions of the accessory genital organs of the bull, (g) thyroid therapy, its effects on sperm production, quality and service capacity, and (h) sterility in bulls.

In the section on animal husbandry, statistics of ghee, milk production and inspection are given. The year was a bad one for departmental herds, because of drought and the heavy cost of foodstuffs. Some herds maintained reasonable records and a comparative production table of the Baraton herd is given for the years 1932, 1935, 1942 and 1944. A few Sahiwal and native cross-bred heifers calved during the year and the constitutional vigour of these crosses seems to be improved. Thirty-six pedigree bulls and cows, 27 rams and ewes and three boars were imported from the Union of S. Africa. Two cattle breeding stations were in operation and details of their work are given. At Kitale difficulties arose from faulty technique on the part of African inseminators. An attempt to use Sahiwal bulls failed, because they would not serve into the artificial vagina—they are naturally sluggish servers. At the Limuru station FOOT AND MOUTH DISEASE in the area closed operations for two months and it was noted how adversely the disease affected the fertility of the herds.

No relevant legislation was enacted during 1944. Twelve papers on widely different subjects were published by staff workers during the year. Abstracts of these have appeared or will appear in the *Veterinary Bulletin*. Statistics of market and production, sheep, goat and cattle purchases, Liebig's factory production, stock and stock products exported are given in table form.

There has been a reduction in the export of hides and skins, as a result of cessation of mortality from RINDERPEST following the intensive immunization campaign, the indifference of the African to the small returns obtained and the lack of goods available for the consumer in the reserves.

—J. G. BROTHERSTON.

I. U.S.A. (1945.) **Department of Agriculture. Report on the Agricultural Experiment Stations, 1944.** pp. 130. Items of veterinary interest pp. 69–73 & 75–80. Washington, D.C.: U.S. Govt. Printing Off. 8vo. 20 cents. **2173**

II. U.S.A. (1946.) **Department of Agriculture. Report on the Agricultural Experiment Stations, 1945.** pp. 172. Items of veterinary interest pp. 95–112. Washington, D.C.: U.S. Govt. Printing Off. 8vo. 20 cents. **2174**

I. Numerous studies on dietetic problems are reported briefly. These include work on the better use of pastures, the production and use of silage, the use of hay, the use of protein feed and the vitamin and mineral requirements of stock. A number of breeding projects for the improvement of livestock are reported and in this connexion work was carried out on artificial insemination, in order to extend the use of high quality sires. It was found possible to dilute semen so as to inseminate 40–80 cows from a single ejaculate and it was shown that the quality of semen could be tested by observing the rate at which it will reduce a dilute solution of methylene-blue. Sulphanilamide in oil and tyrothricin have both given good results in the treatment of streptococcal MASTITIS in cattle. A 5% suspension of silver oxide in oil was found to be efficient in removing *Str. agalactiae* from the dry udder. Triethylene glycol, one part in 600 million parts of air, was effective in killing *S. pullorum* and its use in the elimination of air-borne infection in incubators was being studied. It was shown that sheep could be immunized against BLACK DISEASE by a single subcutaneous vaccination with a 5 ml. dose of an alum-precipitated toxoid. Sulphasuxidine and sulphathalidine have been used successfully in the treatment of infectious CALF SCOURS. A disease resembling PREGNANCY TOXAEMIA in ewes was found to be associated with vitamin A deficiency. An effective vaccine against BLUE COMB of fowls was developed. 1 : 9 to 1 : 15 mixture of phenothiazine and salt kept constantly before sheep was an effective way of administering the drug, but supplementary treatment was required in extreme cases of parasitism. Sarcosporidia were shown to be of considerable economic importance. Sulphasuxidine and sulphaguanidine were shown to be effective in the treatment of COCCIDIOSIS in lambs. Studies were made on the use of heat in farrowing pens and on the importance of artificial light for poultry in stimulating winter egg production.

II. A number of studies are reported on various aspects of the nutrition of farm animals. A factor in corn and wheat was found to stimulate milk flow in cattle. Thyroid hormone fed to laying hens increased yearly egg production by about 10%. Feeding minute amounts of female sex hormone to cocks was found to be a satisfactory substitute for caponizing. Streptococcal MASTITIS could be cured by one injection of 100,000 Oxford units of penicillin *via* the teat canal. Acute cases were given three injections, at 24-hour intervals, of 75,000 units of penicillin per injection. Strains of chicks having high resistance to both FOWL TYPHOID and LEUCOSIS were bred. Vaccination for the prevention of the latter gave promising results. An investigation was being carried out to compare subcutaneous with intracutaneous vaccination of calves against BOVINE BRUCELLOSIS. A new skin test for the detection of PORCINE BRUCELLOSIS infection was developed. Sulphathalidine proved effective as a prophylactic against SWINE ENTERITIS and in treatment when the disease was uncomplicated with PNEUMONIA. Sulphaguanidine was effective therapeutically and prophylactically against WHITE SCOURS in young calves. 10% phenothiazine in salt was shown to be effective in preventing clinical nematode parasitism in lambs at pasture. [For individual station reports, see abst. following.]

—T. E. GIBSON.

Extracts from Annual Reports of Agricultural Experiment Stations, U.S.A. [The matter given here is a bare outline of the work of direct interest to veterinarians. When papers by the staffs of these stations are published abstracts are prepared from them and included in the *Veterinary Bulletin* as a matter of routine. Details of titles of these reports and of relevant papers contained in them will be found in the *Index Veterinarius*.] **2175**

COLORADO, 1943–44.—*Actinomyces necrophorus* was shown to be present in nearly all liver abscesses in beef cattle. Examination revealed a correlation between the occurrence of ulcerative lesions in the rumen and abscesses in the liver.

An experiment was under way to determine whether vitamin A deficiency predisposed cattle to abscesses of the liver. An attempt to assess the value of copper nicotine sulphate mixture for the elimination of *Thysanosoma actinoides* was vitiated by the low incidence of the tapeworm in the control group of sheep. A search for the intermediate host of *Thysanosoma actinoides* was carried out without success. It was thought that magpies may have been responsible for the transmission of distemper to fox ranches. The use of wire floors was found to be only partly effective in elimination of lungworm infection in foxes.

COLORADO, 1944–45.—Further studies were made on the liver abscesses of cattle and showed that liver abscesses developed early in the fattening period and lasted approximately 120 days, after which they declined and scar tissue increased. Further work on the efficacy of copper nicotine sulphate for the control of the fringed tapeworm showed only a slight difference in favour of drenching. A 5% solution of thiocyanate of esters of aliphatic fatty acids in mineral oil proved highly effective against ear mites in foxes and when incorporated in a powder base proved effective in keeping ranches reasonably free from fleas. An attempt to produce NYMPHOMANIA by the injection of testosterone proprionate was partially successful. A survey was made of the incidence of infectious MASTITIS of dairy cattle. 88·8% of herds and 28·92% of animals of 2,106 animals in 125 herds were infected with streptococcal MASTITIS. 2·4% of herds and 50·38% of animals were negative. 5·5% of animals were infected with other organisms causing MASTITIS. Thus 34·42% of the animals examined were found to be affected with some form of the disease.

FLORIDA, 1945.—Studies were being made on the metabolism of cobalt, using radio-active cobalt. Studies on phosphorus, iron and copper metabolism were also continued. Investigation to determine the specific causes of MASTITIS in cattle showed the most common type of organisms involved to be Gram-positive streptococci and staphylococci. The use of penicillin as a therapeutic agent for the condition was being investigated.

GEORGIA, 1943–45.—The control of stomach and nodular worms in sheep by husbandry and by medicinal treatment was being studied. Phenothiazine mixed with nine parts of salt kept continually before sheep proved profitable in the control of stomach worms. *Trichodectes ovis* was eliminated by three dippings in a creosote solution at 16-day intervals after shearing. Sodium fluoride dusted into the wool was also effective in eradicating lice.

GEORGIA COASTAL PLAIN, 1944–45.—An experiment carried out over the years 1941–45 showed that a considerable degree of control of swine parasites could be achieved by farrowing spring litters in individual farrowing houses on land sown to oats. The pigs were creep-fed on protein supplement and minerals during the suckling period and at ten weeks were weaned and moved to areas seeded to field crops, which they harvested during the summer months. The autumn litters were farrowed in the same houses as the spring pigs and were handled similarly in the suckling period. At weaning they were put on a pasture of green oats and given protein and mineral supplements until disposed of at about six months. These pigs harboured few parasites. The use of areas of cultivated land large enough to prevent overcrowding, the practice of allowing farrowing lots to be idle from one farrowing season to the next, the grazing of ensilage crops by the swine over the winter and early marketing contributed to the excellent control of parasite infection in these pigs. Pigs farrowed on and confined to a small area previously heavily contaminated with the infective stages of swine parasites were stunted in spite of abundant food supply.

HAWAII, 1942–44.—The complete life history of the caecal worm (*Subulura brumpti*) of chickens was studied under laboratory conditions. The eggs were infective for five species of beetle, two species of grasshoppers and one species of earwig. Within the body cavity of the insect further development took place and the larvae were infective in 15 days. Further development was conditional upon the beetle or other insect being ingested by a chicken, in the caeca of which the larvae developed reaching maturity in about six weeks. A trial carried out over five weeks showed infection with this parasite to have little effect on the growth rate of chicks. The eggs could remain viable in dried faeces for as long as seven months. Naphthalene was shown to have some effect in controlling the beetle *Alphitobius diaperinus* which acted as an intermediate host for *Subulura brumpti*. In a survey carried out to determine the incidence of *Leptospira* infection in sugar plantation workers and in rodents, 7·5–16·1% of workers in various districts were found to be infected. In N. Kohala, 17·2% of rats and 20·0% of mongooses examined were infected, whilst in Puna district the percentages were 31·3 and 23 respectively.

IOWA, 1944.—Although previously KETOSIS had followed when calves were fed oatmeal gruel, this year none was observed. This was attributed to the higher vitamin A content of the diet in the more recent experiment. The effect of radiation on the aetiological agent of FOWL LEUCOSIS was being studied. Studies on the normal histology of fowls about 20 weeks old were made. A study

of inheritance of resistance to FOWL LEUCOSIS showed that resistance was generally, but not always, dominant. A study was made of the possibility of breeding poultry resistant to FOWL TYPHOID and some success was recorded.

IOWA, 1945.—Ewes fed for ten months on a diet practically free from vitamin E produced normal lambs. BRUCELLOSIS could be controlled in swine by the use of the agglutination test and the segregation of reactors. SWINE ERYSIPELAS was also controlled by testing and segregation of reactors. An apparently new disease of pigs affecting the articulations and serous surfaces was discovered. An investigation was made to determine the value of vegetable oils as a substitute for milk fat in the diet of young calves. Calves fed unemulsified soya bean oil and skim milk tended to lose the hair on the inside of their thighs. The rest of the hair coat was rough and the calves gained weight slowly. Better gains were made on skim milk alone than when soya bean oil was fed. Studies on the normal histology of chickens were continued, investigations being carried out on birds 28 weeks old or older. Strains of White Leghorns resistant to FOWL LEUCOSIS were bred.

LOUISIANA, 1944–45.—Observations showed that in Jerseys and Holsteins tolerance to heat was inherited. Grazing cattle were observed to graze for longer periods at night during hot weather. It appeared that high relative humidity was of minor importance when compared to high armospheric temperature as a factor contributing to the discomfort of cattle in the summer months. Studies on JOHNE'S DISEASE were being carried out to find a reliable diagnostic agent for the disease and to find the length of time that must elapse between tests when a herd was being retested. It appeared necessary to wait more than one month between tests if the same testing site was to be used again. An attempt to grow *Anaplasma* on chick embryos was unsuccessful. Experiments showed that the nodular worm produced its most serious effects during the larval stage and that heavy infestations might cause death. When the worms matured the host animals began to improve in condition although they remained below normal for several months afterwards. PINK EYE in cattle was studied and it was found possible to isolate the causal agent. Low efficiency in treatment was recorded when using the agents sulphanilamide, sulphathiazole, tyrothricin and penicillin.

MISSOURI, 1944.—Experiments on g. pigs showed that certain unrecognized vitamins were required for normal growth and that these vitamins were all supplied by yeast fed at the level of 15%. Experiments were being carried out to determine what vitamins were essential to the nutrition of chicks. An abnormal bleeding condition which was inherited was recognized in swine and studies were being carried out on its nature and inheritance. A number of insecticides were tried for the control of ticks in pasture, but none was effective unless actually sprayed or dusted on to the tick. Insecticides used were 7·8–19·5% nicotine sulphate solutions, derris sulphur and pyrethrum sulphur dusts. D.D.T. was found to be ineffective against the mature ox warble.

MISSOURI, 1945.—Yeast fed at the level of 15% supplied all the vitamins required by the g. pig, although certain strains of yeast were deficient in some members of the vitamin B complex. Liver extracts appeared to supply the vitamins lacking in deficient yeasts. Experiments on rats showed that all the known vitamins except biotin and vitamin K were essential for normal lactation. The amount of phosphorus in the diet also influenced lactation. Studies were being made on the vitamin requirements of poultry. A test was worked out to distinguish swine affected with an abnormal bleeding condition observed in certain lines. Work carried out on the control of ticks in dairy cattle showed that pasture rotation, combined with application of derris dust after milking, greatly reduced tick injury. D.D.T. was found to be ineffective against the mature ox warble. Feeding thyroxin to swine shortly before farrowing proved injurious, but its use after farrowing increased the weaning weight of pigs approximately 0·25%. An inherited dwarf condition in sheep was recognized and found to be associated with a disturbance of the thyroid gland. An attempt was made to devise a pregnancy test for bovines by the recognition of certain enzymes present in the blood only during pregnancy. Thyroxin and iodinated casein fed to rams of low fertility increased the number of sperms present in the semen, whilst the administration of gonadotropic hormone increased the number of sperms and the volume of the semen. Thiouracil fed to rams reduced their fertility. The storage of rooster semen reduced its fertility. In studies made on the use of diethylstilboestrol for the stimulation of growth and lactation, the dosage range which diminishes established lactation was determined. Thyroprotein was shown to increase the milk fat production of dairy cows 15–20%. Udder injections of the following were used in the treatment of MASTITIS: colloidal silver oxide, sulphanilamide and mineral oil, sulphanilamide, iodine and mineral oil and tyrothricin. The two sulphanilamide preparations were considered the most effective.

NEBRASKA, 1944.—Experiments were made on the possibility of long distance shipments of bovine semen and successful inseminations were

carried out with semen 152 hours old at the time of insemination. An investigation showed that mouldy corn was not harmful to young chicks. A table is given of the riboflavin assay of various poultry foods. The validity of culture vaccines used in the control of SWINE ERYSIPELAS in the State was tested and the factors which may impair the quality of the culture material were investigated. The possibility that a virus was a contributory factor in the aetiology of SWINE ERYSIPELAS is being investigated.

NEBRASKA, 1945.—*E. rhusiopathiae* was found to be sensitive to penicillin and adequate doses (2,400–3,600 Oxford units) caused pigeons to survive inoculations of the virulent cultures. Penicillin may be of use in the early stages of SWINE ERYSIPELAS and in the treatment of ERYSIPELOID in man. Sulphadiazine given in the food was not effective in protecting turkey poults against SALMONELLOSIS. 6·5% sulphamerizine in the food did show some degree of protection but not sufficient to warrant its use in practice. *S. typhi-murium* was not very sensitive to penicillin.

NORTH LOUISIANA, 1939–40.—The study of a dairy herd showed that the reasons for culling animals were as follows: low production 40·7%, members of poor family 16·7%, non-breeding 18·5%, death 9·2%, sickness 5·6%, old age 3·7%, deformity 3·7%, udder trouble 1·9%.

SOUTH DAKOTA, 1943–44.—The mechanism by which arsenic counteracts selenium toxicity was investigated: the vitamin *p*-aminobenzoic acid appears to be involved. *Astragalus pectinatus* was found to be one of the "indicator" plants which required selenium for growth under natural conditions. A survey of the parasites of sheep was carried out. Attempts to produce CORNSTALK DISEASE artificially were unsuccessful.

WASHINGTON, 1944.—Nutrition experiments showed that the thiamin content of the tissues of pigs depends on the amount of thiamin present in the diet. Studies on the adequacy of the vitamin A content of various roughages for reproduction and lactation in sheep were being made. Iodinated casein, pregnant mare serum and diethylstilboestrol had apparently little effect on the amount and quality of semen produced by rams. Pigs fed apples heavily sprayed with lead arsenate had no ill effects from consumption of the insecticide. An *in vitro* test for the preliminary evaluation of substances for the treatment of bovine MASTITIS was being worked out.

WASHINGTON, 1945.—Pigs farrowed by gilts fed either a choline- or thiamine-deficient diet had characteristic leg weakness at birth, did not gain normally during the sucking period and were unthrifty in appearance at weaning time. Alfalfa and wheat hays and brine and blue grass straws provided enough vitamin A for the adequate nutrition of pregnant ewes. This was attributed to the adequate storing of vitamin A during the previous summer. 1% sulphaguanidine in the food was effective in the protection of poults against COCCIDIOSIS.—T. E. GIBSON.

U.S.A. (1945.) **Sixth annual report of the Regional Poultry Research Laboratory, East Lansing, Michigan, July 1, 1944 to June 30, 1945.** pp. 25. Mimeographed. **2176**

As in previous years, the annual report of the Laboratory describes the progress of the FOWL LEUCOSIS research programme, including the results of short term experiments and reports of long term ventures, such as the development of resistant and susceptible strains of fowls.

Further evidence was obtained confirming previous reports that LYMPHOMATOSIS is spread by contact where young chickens from susceptible parental stock, which has remained free of any clinical manifestation of the disease for more than three years, are brooded with infected stock. In view of the long incubation period of the naturally occurring disease, extensive experiments were carried out to develop more virulent strains of the agent causing the disease. These experiments demonstrated that the neoplastic cells of tumours occurring in the disease, when implanted in young chicks, induced typical lymphoid tumours in as short a time as 11 days after inoculation. The tumours so produced were both grossly and microscopically similar to those providing the original inoculum.

The possible presence of a filtrable agent in the inoculum was investigated. Cell-free inocula were obtained from a lymphoid tumour strain that had been propagated in over 200 serial passages by the transplantation of neoplastic cells and the results of its inoculation were compared with those for inocula containing viable cells from muscle or liver tumours. The results suggested that the transplanted tumour cell was responsible for tumours which developed in 7–10 days at the site of inoculation, with metastasis to other tissues, and that a filtrable agent produced lymphomatous tumours of the visceral organs and osteopetrosis after a longer incubation of 2–6 months, without inducing a tumour at the site of inoculation.

Work was carried out to study immunity and cross immunity reactions of lymphoid tumour strains and results indicated (a) that chickens surviving implants of a lymphoid tumour were immune to subsequent reimplantations of the same tumour strain, (b) that cross immunity existed between three of the seven RPL strains studied and (c) that chickens proved to be immune to the lymphoid tumour by repeated implantations

developed a high incidence of lymphomatous tumours of the visceral organs after a relatively long incubation period.

The feeding of sulphamezathine and sulphathiazole at a level of 4 grammes per lb. of feed had no prophylactic or therapeutic effect on the transplantable lymphoid tumours.

The development of unrelated lines of fowls relatively resistant to the disease and of other unrelated lines susceptible to the disease was continued. The results already obtained are thought to warrant the conclusion that the practice of selecting and breeding chickens for resistance to the disease is well founded and valid.

The results of certain studies incidental to the principal projects in progress are also reported, together with work carried on in conjunction with the State Agricultural Experiment Station. Such studies include reference to the influence of feed on eye colour, the influence of diallel crossing on hatchability and egg weight, and the influence of inbreeding on sexual maturity.—J. D. BLAXLAND.

BOOK REVIEWS

ASDELL, S. A. [M.A., Ph.D., Professor of Animal Physiology, New York State College of Agriculture, Cornell University]. (1946.) **Patterns of mammalian reproduction.** pp. x + 437. Numerous figs. & tables. London: Constable & Company Ltd.; Ithaca, N.Y.: Comstock Publishing Company, Inc. 8vo. 27s. 6d. **2177**

In bringing together all the available information on the subject of mammalian reproduction within the covers of one volume, the author has performed a most valuable service for all those interested in the subject since hitherto much of the material has been widely scattered in the literature.

A consideration of such things as sex determination, sex hormones and the response to hormone administration, pregnancy, and the general principles of mammalian reproduction introduces the book; some 900 species, listed under their natural orders, are then considered separately. Whenever possible details of the breeding season, histology and physiology of the reproductive tract, etc., are given. Perhaps two points most clearly emerge from this work, firstly that our knowledge of the ways of mammalian reproduction is extremely limited and secondly, that although the object, *i.e.*, the production of viable young, is the same, different species show a great deal of variation in accomplishing this result. These differences, it is suggested, may be due to differences in the output of the endocrine system or variation in the amount of hormone necessary to induce a response in a particular organ. These are important considerations which must be more fully investigated since they help to explain the disappointments sometimes experienced with hormone therapy and clearly show why results obtained with one species cannot be directly applied to another.

The book is mainly one for reference and is very fully documented for this purpose: nevertheless a connected account is presented for each species, which makes it easy to read. Moreover, it brings out lines of research which urgently require to be undertaken.—J. A. NICHOLSON.

ASH, J. E. [M.C., Director, Army Institute of Pathology], & SPITZ, S. [M.D., C.S., A.U.S., Pathologist, Army Institute of Pathology]. (1945.) **Pathology of tropical diseases. An atlas.** pp. x + 350. 941 figs., 257 plates. Philadelphia & London: W. B. Saunders. 4to. £2. **2178**

The diseases dealt with in this book include virus diseases, bartonellosis, rickettsial infections, treponematosis and spirochaetosis, dysentery, bacterial diseases, leprosy, mycoses, trypanosomiasis, leishmaniasis, malaria, helminthiasis, environmental conditions due to climate or insects, deficiency diseases, tropical ulcer and ainhum. After brief notes on the epidemiological and clinical features of each condition, a description is given of the pathological findings, which are excellently illustrated by photomicrographs and, in some cases by coloured plates.

It is claimed in the preface that the study of the pathology of tropical diseases has been largely neglected and it is hoped that this atlas will help to fill the void. No doubt this is largely correct but it is rather doubtful if it is justifiable to classify such diseases as smallpox, rabies, epidemic typhus, leptospirosis, typhoid fever, North American and European blastomycosis, actinomycosis and many of the helminthic infections as tropical.

The account of the pathological features is confined to the disease in man and has a comparative veterinary interest, but the epidemiological notes are so short that references to the influence of animal hosts are often omitted and when they occur the subject is not fully dealt with. For instance, in the case of African trypanosomiasis it is said that "Wild and domestic animals are reservoirs, but in some areas the chief source of infection is man."—U. F. RICHARDSON.

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